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Statistical Information Bulletin for Africa

No/Nº 20

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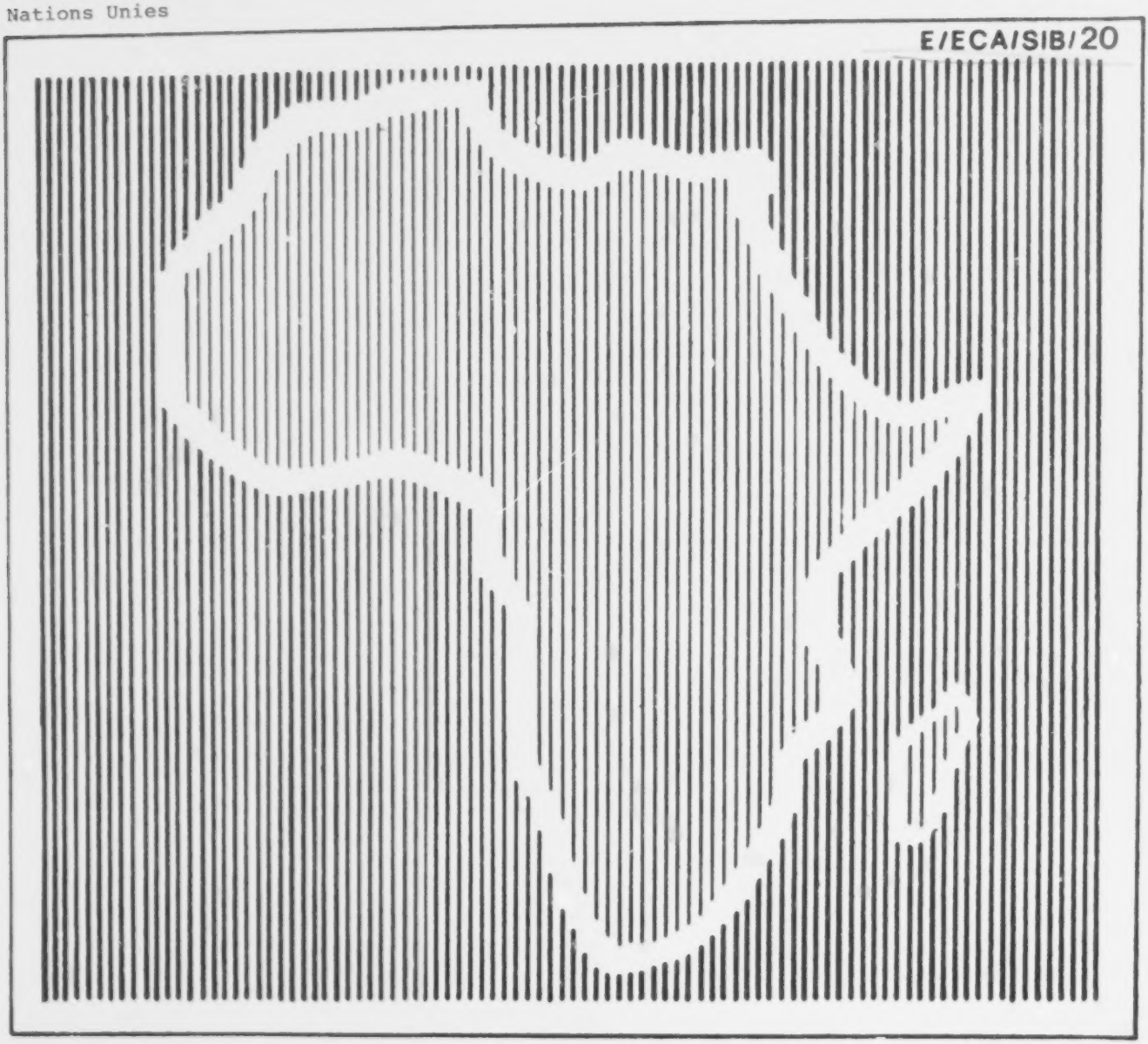

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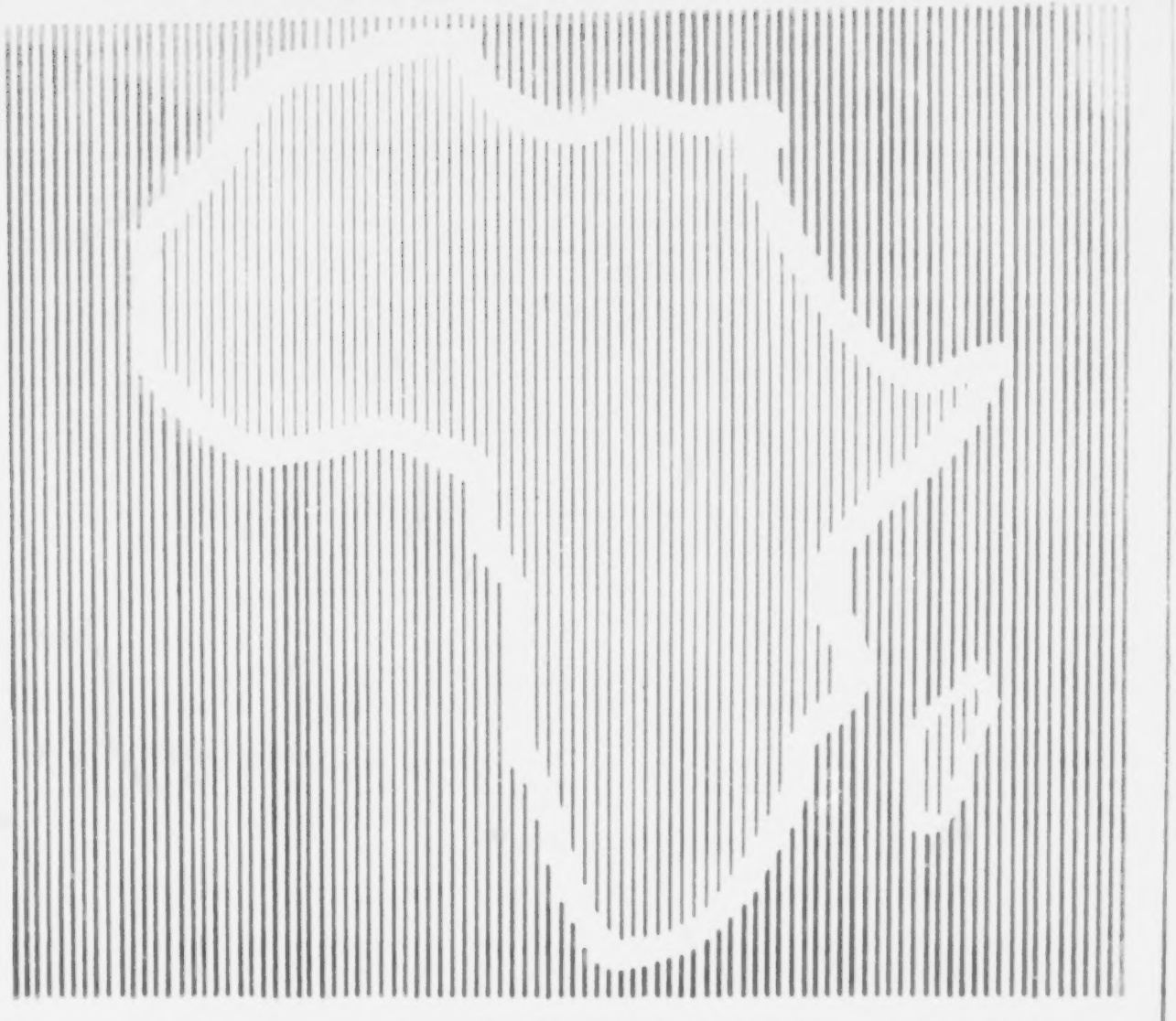

Bulletin d'information statistique pour l'Afrique

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Editorial Note

This issue of the Statistical Information Bulletin features the "Addis Plan of Action for Statistical Development in Africa in the 1990s", recently adopted by the Sixth Session of the Joint Conference of African Planners, Statisticians and Demographers. The Plan will be submitted to the ECA Conference of Ministers in Tripoli, Libyan Arab Jamahiriya (15-19 May 1990) and will, if approved, become an important frame of reference for statistical development in Africa.

This Bulletin also contains other contributions on statistical development, such as a document on the future role of statisticians which the Economic and Social Commission for Asia and the Pacific (ESCAP) has kindly permitted ECA to reproduce. Apart from informing on statistical training for Portuguese-speaking countries in Africa and on research activities in STPA centres this issue also presents a methodology for collecting data on construction statistics. Finally, updates on census-related issues are being provided. This includes a list of the status of population censuses as well as an article on census cartography.

We regret to inform the readers of the Statistical Information Bulletin for Africa that, due to resource constraints, this issue wil be the last one in the series. This will, however, not mean the discontinuing of the publication of statistical studies. In fact, it is hoped that by issueing single papers in the future, the long delays encountered in the past will be avoided. The Sixth Session of the Joint Conference of African Planners, Statisticians and Demographers urged the ECA secretariat to make every effort to continue its contribution to the statistical discussion in Africa.

Note de la rédaction

Ce numéro du Bulletin d'information statistique met en manchette le "Plan d'action d'Addis-Abeba pour le développement statistique en Afrique dans les années 1990" adopté par la sixième session de la Conférence commune des planificateurs, statisticiens et démographes africains. Ce plan sera présenté à la Conférence des ministres de la CEA à Tripoli, Jamahiriya arabe libyenne (15-19 mai 1990) et deviendra, s'il est approuvé, une importante base de référence pour le développement statistique en Afrique.

Ce numéro contient également d'autres contributions pour le développement statistique, comme un document sur le rôle futur des statisticiens que la Commission économique et sociale pour l'Asie et le Pacifique (CESAP) a aimablement autorisé la CEA à reproduire. Hormis les informations sur la formation statistique des pays africains de langue officielle portugaise et sur les activités de recherche dans les centres (PFSA), ce numéro présente également une méthodologie pour la collecte des données sur les statistiques de construction. Enfin, il fournit une mise à jour des questions relatives aux recensements. Ceci inclut une liste des recensements de population, ainsi qu'un article sur la cartographie censitaire.

Nous avons le regret d'informer les lecteurs du Bulletin d'Information Statistique que ce numéro, à cause des contraintes budgétaires, sera le dernier de la série. Cependant, cela ne signifie pas l'arrêt définitif des publications sur les études statistiques. En effet, on espère qu'en publiant des études de façon séparée dans l'avenir, les longs délais que l'on a connu dans le passé seraient évités. La sixième session de la Conférence commune des planificateurs, statisticiens et démographes africains a recommandé que le secrétariat de la CEA ne ménage aucun effort dans la poursuite de sa contribution aux débats statistiques en Afrique.

ADDIS ABABA PLAN OF ACTION FOR STATISTICAL DEVELOPMENT IN AFRICA IN THE 1990s*

PREAMBLE

The ECA Conference of Ministers,

Reviewing the development of statistics in Africa over the last thirty (30) years,

Reviewing the current statistical capacities in African countries,

Reviewing major factors governing success and failure of the performance of national statistical services,

Stressing the strategic role of quantitative analysis for improving decision-making for sustainable development,

Mindful that data demands to formulate, monitor and evaluate policy reforms and development plans are increasing,

Noting with great concern the continuing low profile accorded to national statistical services and deteriorating conditions of service,

Concerned about a lack of consideration of national plans and priorities as well as some duplication in internationally sponsored statistical development programmes,

Reaffirming the collective commitment of African Planners, Statisticians and Demographers to accelerate self-reliant, social and economic development for the well-being of African peoples,

Adopts the following Plan of Action for Statistical Development in Africa in the 1990s.

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* **Draft adopted by the Sixth session of the Joint Conference of African Planners, Statisticians and Demographers and submitted for consideration and adoption to the ECA Conference of Ministers.**

PRINCIPLES AND OBJECTIVES

Principles

1. Statistics is a vital tool in national development planning.

2. African statistical services need to become fully self-reliant.

3. Statistical programmes should respond to African Covernment's commitment to self-reliant development.

4. International co-operation and support in the field of statistics should respond to priorities and programme s. o f National Statistical Services (NSS).

5. Adequate and reliable statistics are a prerequisite for designing, monitoring and evaluating projects

6. Increased communication at all times between users and producers of statistics is an important resource in itself which, once started, would generate additional resources through the attractiveness of its product.

7. Any improvement of the statistical system constitutes an integral part of economic and social development.

8. ECA should be recognized as the key regional institution responsible for the development and promotion of statistics in Africa.

Objectives

1. To achieve self-sufficiency in statistical production, including the creation of a comprehensive national statistical data base by the end of the century.

2. To improve the reliability and relevance of data produced in African countries.

3. To undertake production of data required for formulating, monitoring and evaluating programmes designed to restructure and transform African economies.

4. To improve the timeliness in the production and dissemination of statistical information.

5. To increase awareness among users of statistical information.

6. To strengthen and sustain statistical training programmes at various levels and institutions.

7. To promote contact and dialogue amongst African Statisticians.

8. To encourage improvement in the organizational set-up of the NSS and assure its autonomy.

9. To improve co-ordination of all statistical development programmes at both national and international levels.

RECOMMENDATIONS

A. TO GOVERNMENTS-MEMBER STATES OF ECA

1. A higher priority should be accorded to statistical activities and statistics should be seen as central to the formulation of plans and strategies.

2. Adequate funding should be provided for statistical activities.

3. Assistance should be provided in the establishment of a Statistical Development Fund with contributions from the public as well as the private sector.

4. Governments should ensure that the legislation governing the statistical services in their countries assures their utmost effectiveness.

5. ECOWAS's 18th of November should be adopted as <u>African Statistics Day</u> in order to increase public awareness for the important role which statistics play in all aspects of social and economic life.

6. African governments are urged to continue to give support to the African Statistical Association (AFSA).

Organisation of Statistical Services

7. The organisational structure of the NSS should be examined carefully and, where necessary, restructured in order to meet the various data needs.

8. In order to attract and retain suitable manpower Governments are urged to develop attractive schemes of service for statisticians.

Work programme

9. The NSS should prepare longer term statistical development programmes (e.g. 5 or 10 years) in the context of National Development Plans. Such programmes should serve as a guide and framework for annual or biennial national statistical work programmes.

10. A budget document showing details of inputs and final outputs to be delivered by the NSS should be prepared for each financial year.

Statistical Committees

11. Countries are requested to set up National Statistical Councils composed of senior civil servants, representatives of universities, NGOs and the private sector. Such a Council should act as an advisory board on policy matters relating to statistical matters.

12. User/producer and producer/producer committees should be reactivated in countries where they exist or should be initiated in countries where they do not exist. These committees enable exchange of views regarding development of statistics, uses of available statistics and the setting up of priorities for the country's statistical activities.

Establishment of Statistical Priorities

13. In accordance with the Lagos Plan of Action and the Final Act of Lagos, NSS should consider the following as priority areas in future statistical programmes: food and agriculture, industry, human resources, transport and communications, trade and finance, environment, energy, women and development, population and development and the informal sector.

Statistical Training

14. NSS and statistical training institutions at the national level should organise specialized short-term training courses in statistics.

15. National Statistical Offices are urged to prepare and implement statistical development programmes which would help them to fully utilise available training facilities.

16. The linkage of NSS with statistical and other training institutions should be encouraged, where absent, and strengthened, where it exists.

17. All governments should give support to centres. participating in the Statistical Training Programme for Africa (STPA).

Seminars

18. National seminars covering specific or broad areas with participation drawn from government as well as research and training institutions should be organised on a regular basis and should be included in the

programme of work.

Data Quality and Dissemination

19. In order to improve the quality of information collected, NSS are requested to consider setting up in their offices an organisational unit on methods and standards.

20. NSS are urged to ascertain that data are published with minimum delay.

21. As research is a vital element in statistical development, NSS are encouraged to include research as an integral part of their statistical activities

B. TO INTERNATIONAL ORGANIZATIONS

22. UNDP and other multi-lateral and bi-lateral agencies are urged to enhance the scope and implementation of the ongoing Statistical Development Programme for Africa (SDPA) for Africa and other programmes, respectively.

23. More effective use should be made of the Joint Conference of African Planners, Statisticians and Demographers, of the United Nations ACC Sub-Committee on Statistical Activities and the Statistical Commission as institutional arrangements to improve co-ordination among international agencies.

24. ECA should take the initiative to convene a working group meeting to further review and elaborate on the principles, objectives and recommendations of this Plan of Action and formulate detailed strategies for its implementation.

LE PLAN D'ACTION D'ADDIS ABEBA POUR LE DEVELOPPEMENT DE LA STATISTIQUE EN AFRIQUE DANS LES ANNEES 90*

PREAMBULE

La Conférence des ministres de la CEA,

Après examen du développement de la statistique en Afrique ces dernières années,

Après étude des capacités actuelles en statistique dans les pays africains,

Après examen des principaux facteurs de succès et de faiblesse dans les performances des services nationaux de statistique,

Après avoir souligné le rôle stratégique de l'analyse quantitative pour l'amélioration des décisions soutenant le développement,

Consciente du fait que les besoins en données pour la formulation, l'exécution et l'évaluation des politiques de réforme et des plans de développement sont de plus en plus nombreux,

Après avoir noté avec une grande inquiétude la baisse continue de l'intérêt accordé aux services nationaux de statistique et la détérioration de leurs conditions de travail;

Inquiète du peu d'intérêt accordé dans les plans et priorités nationaux aux programmes de développement statistique bénéficiant d'une assistance internationale,

Après avoir réaffirmé l'engagement collectif des planificateurs, statisticiens et démographes africains d'accèlerer un développement économique et social indépendant pour le bien être des populations africaines,

Adopte le Plan d'action pour le développement de la statistique en Afrique dans les années 90.

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* Projet élaboré par la Conférence commune des planificateurs, statisticiens et démographes africains à la sième session, et qui sera soumis à la Conférence des ministres de la CEA pour examen et adoption.

PRINCIPES ET OBJECTIFS

Principes

1. La statistique est un instrument vital dans la planification du développement national;

2. Les services statistiques africains doivent devenir entièrement autosuffisants;

3. Les programmes statistiques devraient répondre aux engagements des gouvernements africains en vue d'un développement autosuffisant;

4. La coopération et l'assistance internationales dans le domaine de la statistique devraient répondre aux priorités et aux programmes des services nationaux de statistique (SNS);

5. Les données statistiques adéquates et fiables sont un préalable indispensable dans la conception, le suivi et l'évaluation des projets;

6. La communication accrue à tout moment entre utilisateurs et producteurs de statistiques est en soi une ressource importante qui, une fois amorcée, pourrait générer d'autres ressources à travers l'attrait de son produit;

7. Une amélioration du système statistique constitue une partie intégrante du développement économique et social;

8. La CEA devrait être reconnue comme la principale institution régionale responsable du développement et de la promotion de la statistique en Afrique.

Objectifs

1. Atteindre l'autosuffisance dans la production statistique, y compris la création d'une base de données statistiques nationales d'ici la fin du siècle;

2. Améliorer la fiabilité et la pertinence des données statistiques produites dans les pays africains;

3. Entreprendre la production des données requises pour la formulation, le suivi et l'évaluation des programmes conçus pour la restructuration et la transformation des économies africaines;

4. Améliorer les délais de production et de diffusion de l'information statistique;

5. Accroître la prise de conscience des utilisateurs de l'information statistique;

6. Renforcer et soutenir les programmes de formation statistique des diverses institutions à tous les niveaux.

7. Promouvoir le contact et le dialogue parmi les statisticiens africains;

8. Encourager l'amélioration de la structure organisationelle des SNS et assurer leur autonomie;

9. Améliorer la coordination de tous les programmes de développement statistique tant aux niveaux national qu'international;

RECOMMANDATIONS

A. AUX GOUVERNEMENTS DES ETATS MEMBRES DE LA CEA:

1. Une grande priorité devrait être réservée aux activités statistiques et les statistiques devraient être considérés comme fondamentales pour la formulation des plans et des stratégies;

2. Des ressources financières adéquates devraient être allouées aux activités statistiques;

3. Une assistance devrait être fournie pour la création d'un Fonds de développement statistique avec des contributions provenant des secteurs public et privé;

4. Les gouvernements devraient s'assurer que la législation régissant les services statistiques de leur pays garantissent leur entière efficacité;

5. La journée du 18 novembre, journée de la CEDEAO, devrait être adoptée comme Journée africaine de la statistique en vue de sensibiliser le public à l'importante du rôle que joue la statistique dans tous les aspects de la vie économique et sociale;

6. Les gouvernments africains sont priés de continuer à soutenir l'Association africaine de statistique (AfSA);

Organisation des services statistiques

7. La structure organisationnelle du SNS devrait être examinée soigneusement et, si nécessaire, réorganisée en vue de satisfaire les nombreux besoins en données;

8. Les gouvernements devraient créer des conditions de travail attrayantes pour les statisticiens en vue d'attirer et de retenir les ressources humaines appropriées;

Programme de travail

9. Les SNS devraient préparer un programme de développement de la statistique à plus long terme (c'est-à-dire 5 ou 15 ans) conforme aux plans nationaux de développement. Un tel programme servirait de guide et de cadre pour les programmes de travail nationaux annuels ou biennaux;

10. Un document budgétaire indiquant les approts et les produits finals des SNS devrait être élaboré pour chaque exercice budgétaire.

Comités statistiques

11. Il est demandé aux pays de mettre en place des conseils nationaux de statistique composés de hauts fonctionnaires, de représentants des universités, des organisations non gouvernementales et du secteur privé. De tels conseils devraient agir en tant que conseils consultatifs sur les politiques en matière de statistique.

12. Des comités utilisateurs/producteurs et producteurs/producteurs devraient être réactivés dans les pays où ils existent ou créés là où ils n'existent pas. Ces comités permettent des échanges de points de vue relatifs au développement de la statistique, à l'utilisation des statistiques disponibles et à l'établissement des priorités pour les activités statistiques des pays.

Etablissement des priorités statistiques

13. Conformant au Plan d'action de Lagos et à l'Acte final de Lagos, à l'avenir les programmes des services nationaux de statistiques devraient considérer les domaines ci-après comme prioritaires: alimentation et agriculture, industrie, ressources humaines, transports et communications, commerce et finances, environnement, énergie, femmes et développement, population et développement et secteur non structuré.

Formation statistique

14. Les SNS et les institutions de formation statistique au niveau national devraient organiser des sessions spécialisées de formation de courte durée en statistique;

15. Les SNS sont exhortées à préparer et mettre en oeuvre des programmes de développement statistique qui les aideraient à utiliser pleinement les installations de formation existantes;

16. Les liens entre les SNS et les autres institutions de formation statistique devraient être encouragés là où ils n'existent pas et renforcer là où ils existent.

17. Tous les gouvernements devraient apporter leur soutien aux centres du PFSA.

Séminaires

18. Des séminaires nationaux couvrant des domaines spécifiques ou généraux avec la participation de l'Etat, des institutions de recherche où de formation devraient être régulièrement organisés et inclus dans le programme de travail.

Qualité des données et diffusion

19. En vue d'améliorer la qualité des informations rassemblées, les SNS sont priés d'envisager la création en leur sein d'une unité administrative sur les méthodes et les normes.

20. Les SNS sont instamment priés de s'assurer que les données sont publiées dans un délai minimum.

21. La recherche est un élement essentiel dans le développement statistique. Les SNS sont invités à l'inclure comme partie intégrante de leurs activités statistiques.

B. AUX ORGANISATIONS INTERNATIONALES

22. Le PNUD et les autres organismes bilatéraux et multilatéraux sont instamment priés d'élargir le champ et la mise en oeuvre du projet PDSA et des autres programmes.

23. Une utilisation plus efficace de la Conférence commune des planificateurs, statisticiens et démographes, du Sous-comité sur les activités statistiques du Comité de administratif de coordination et de la Commission de statistique des Nations Unies, devrait être faite en vue d'un arrangement institutionnel pour améliorer la coordination entre les organisations internationales.

24. La CEA devrait prendre l'initiative de réunir un groupe de travail pour approfondir et élaborer les principes, les objectifs et les recommandations du Plan d'action et formuler des stratégies détaillées pour sa mise en oeuvre.

DATA INTERPRETATION AND ANALYSIS: THE STATISTICIANS'S ROLE

Introduction

1. The demands on, and the need for, official statistics are increasing continually. This is reflected in the requirements of the policy makers and other administrators, not to mention the use of information in media discussions. While data reliability and timeliness remain fundamental, policy makers increasingly need more refined statistical products. The refinements include in-depth analyses which are relevant to decisions, more detailed explanations which assist in understanding issues, and more sophisticated graphs, diagrams and charts which facilitate comprehension. What the data mean has become as important as what the data are.

2. In parallel with these developments, funds for producing statistics are typically decreasing or, at best, static. In many countries, moreover, public opinion is becoming increasingly unfavourable towards the collection of data, whether from individuals, households or commercial enterprises. Many statistical agencies therefore have to contend with rising non-response, which erodes the quality of data. This unhappy combination of circumstances puts tremendous pressure on national statistical offices which, short-staffed as they generally are, often lack the capacity to undertake in-house research or attempt to resolve problems using innovative approaches. In such an environment it will be difficult to produce official statistics to meet the varied demands in the decades ahead. The present paper highlights the issues involved, outlines one set of views on the role of government statisticians in the decision-making process, and seeks the opinions of the Commission as guidance for national statistical services. 1/

1/ Some of the ideas in this document have been discussed previously at various international forums, such as the sessions of the International Statistical Institute. They are included here because of their relevance in the region.

Source: Issues and programmes in various fields of activity of ESCAP: Reports of legislative committee meetings held since the forty-fourth session of the Commission and selected issues in different sectors, (ECA/ESCAP/665, 12 January 1989).

N.B: ECA gratefully acknowledges the permission of ESCAP to reproduce this document.

The changing environment

3. The growth in official statistics over the last four decades or so has come from three sources: first, intellectual development of the discipline leading to expanded capabilities and uses of statistics; second, the advances in computer and communication technologies facilitating the compilation and pprocessing of information; and third, the functional evolution of the modern state. As Governments extended their activities beyond taxation, national defence and international relations to become welfare-oriented, the demand for and use of official statistics expanded.

4. The growing complexity of societies has also changed the process of policy-making. Government sectors are much more interactive, creating tensions and effects external to themselves. Often the private sector is also involved. Trade- offs between conflicting goals and interests, for example between agricultural outputs, trade policy and external relations, have to be determined. These complex issues create a critical need in the statistical system for a much more intimate involvement in top-level policy processes. They also create a demand for much greater integration of diverse data bases and an even more pressing need for relevant analysis and interpretation of the data.

5. Changing economic practices are also altering the nature of statistical demands. Analysis of macro-economic activities can no longer be conducted separately from that at the micro level. Micro-economic simulation analyses depended on the combination of various types of sectoral models with micro-economic variables. The demand for micro-statistics for this purpose is growing, requiring new data, larger samples for accurate small area and economic sub-sector collections, and greater accompanying efforts in conceptual development, standardization and integration of statistics.

6. The business sector has long been both a provider and a user of official statistics. It is also fast becoming a major producer of statistics, in some specific cases with products in direct competition with official statistics. Many institutions, in fact, are in the business of analysing and presenting, sometimes even collecting, statistics. They include research institutes, public and private sector interest groups, universities, and some foundations, to name only a few. The information industry has already been created, in response to the need for decision-specific information which neither the public sector nor a typical commercial or manufacturing firm was prepared or able to provide. Specialized information enterprises have started selling data and analysis. They undertake consultancies, research, data base

development for modelling and forecasting, data collection and analysis, data communication and publishing services. Many information industry firms also engage in further processing and analysis of official statistics into specialized forms which they sell not just to the private sector but also to government agencies.

7. Amid these developments, and for a variety of reasons, resources allocated to national statistical services have not grown in parallel with overall demand for offical statistics. This divergence between demands and resources is requiring far greater emphasis on efficiency in statistical organization and production, with a greater reliance on cheaper sources of data such as administrative records. It also increases the need for clear, consistent statistical priorities focused around strictly structured medium-term statistical programmes which encompass all components of a national statistical system.

8. A misunderstanding of the nature of the complex process through which statistics are generated often persists, and in some instances is further compounded by a growing negative perception of statistical agency performance. Some policy makers believe that statisticians and their organizations are unresponsive, producing a lot of unused numbers, yet chronically unable to provide the relevant figures when called upon. The statisticians are thus ignored and the statistical agencies discounted. From the statisticians' viewpoint, some of the same policy makers demonstrate that they have little notion of where the numbers come from; that they are totally innocent of any knowledge of the statistical system; and that they assume that statistics are available at virtually no cost and on call without the need for prior planning. The statisticians also feel that the expectations of the policy makers are sometimes unrealistic; for instance, a population census which is not 100 per cent accurate but which is accompanied by an estimate of undercount is not necessarily a failure on the part of a statistical agency.

Implementations for official statisticians

9. In the rising tide of complexity which they face in decision-making, the users of statistics look for ways to simplify, to interpret and to understand. If there are to be satisfied users and strong supporters of statistics, there must be a change in both the input and the output of statisticians and thus in their institutional role. The official statisticians are becoming increasingly aware that it is they alone who can overcome their problems, and in the process promote the position of statistics from the end of the queue for resources.

10. There are activities which by consensus are properly the

domain of official statistical organizations; but they will not necessarily remain so unless the statisticians develop the capability and commitment to serve increasingly specialized and complex decision needs. They have to accept the obligation to provide relevant and accurate information to the general public and to government policy makers and their subordinates. As major societal problems or issues are identified, official statistical organizations must develop problem descriptions with good data, and objective analyses of alternative approaches which have been suggested to those problems. The information base so developed not only serves the public but also leaves the statistical agency much better prepared to develop the decision-specific types of analysis needed by public policy makers.

11. Statisticians must therefore find simpler ways to represent complex societal problems, and to do that they must undertake far more data analysis. One of the reasons that policy makers question the usefulness of statisticians is the frequent inability of statisticians to explain adequately the significance of their own data. When the policy maker subsequently obtains at least part of what he was looking for from a government policy analyst, or even a private sector consultant, the negative impression of statisticians tends to be confirmed. Several national statistical agencies in the ESCAP region are able to provide good analysis. But others are not, and it is here that some concerted efforts both from within the national statistical services and from external technical assistance sources are required.

12. Moreover, it is inadequate merely to make the output available to the public. The statistical product must be marketed. The product is usually complex; the market is segmented; the potential consumer is often uninformed. While the total value of the product to the public may be quite significant, the value of many statistics to any single citizen is limited. Statistical agencies therefore need marketing strategies to deal with this complexity if they are to serve the general public adequately. An intelligent use of the media is crucial for this purpose.

13. The advent of the information industry was mentioned earlier in the paper. The industry is fast developing, spurred by computers and communication facilities. Private-sector information firms can constitute an indictment of and a threat to the official statistical enterprise. If statisticians are to survive in the long run as anything more than collectors of data, they must compete effectively to serve all users. Such competition would improve the performance of both the official statistical agencies and the private firms. To be successful in this area, statisticians have to work closely with the users in the design of statistical collections and in the marketing of data. This could mean finding new ways to create a statistical capability in a linkage to the various relevant ministries of governments. Greater analytical services for adaptation and interpretation of data have

to be developed, on-line data bases established and maintained, and processing capability strengthened to back up the necessary analysis. Some statistical agencies in the region have taken initial steps in these areas, but more sustained efforts are necessary.

14. Some national statistical agencies, because of their position in the government and the legal authority bestowed on them, tend to develop a monopolistic attitude towards their product, which can in the longer run have a negative impact on the agency's reputation and support from both the public and the private sectors. An open, co-operative and responsive attitude towards all who are concerned with information would be more productive. Leadership in adopting statistical innovations and new technologies, as well as more assertive participation in the government policy process, would also help. The values that should be cultivated by national statistical agencies are openness of process plus quality, relevance and integrity of product. National statistical agencies are already doing many things well, some of them far better than the private sector. But further efforts are required.

15. Finally, the need for interaction between statistics and policy is overwhelming. Skills, leadership and institutions that allow close and effective working relations with decision makers need to be developed if the performance of the national statisticians is to improve in the eyes of the policy makers. While highly subjective policy analysis, particularly involving political value judgements, is to be avoided, there is an absolute necessity to offer the users objective data analysis together with various types of subject-matter and problem- oriented options, including projections, and even forecasting and modelling services.

16. Government statisticians seem to be losing out to computer and subject-matter professionals in the choice of leadership to manage the large information systems that support the policy process. This may be because these other professionals are perceived frequently to have either broader experience and managerial skill, or greater understanding of the analytical requirements. If national statistical agencies are to be more in control of their future, they should pay greater attention to exposing young statisticians to varied experience, consciously train more statisticians in management, and support more analysis in statistical offices.

The way forward

17. Government statisticians are extremely cautious in accepting changes in statistical production processes. A good reason for this attitude is that the cost of the disruptions can easily outweigh the value of some innovations. Every national statistical agency has disturbing illustrative stories. However, changes have

to come if a number of difficult challenges confronting official statistics are to be met. The Commission is invited to review and consider the changes and the challenges described above and offer its views and guidance on how government statisticians and national statistical services can play their role effectively and impressively in the decade of the 1990 and thereafter. In particular, the commission may wish to comment on the need for statisticians to enhance awareness in analysis and interpretation and participation in the policy process; and on the disparity between information demands and declining resources for statistical services.

L'INTERPRETATION ET L'ANALYSE DES DONNEES: LE ROLE DU STATISTICIEN

(Résumé)

Le document "Data Interpretation and Analysis. The Statistician's Role" (L'interprétation et l'analyse des données: le rôle du statisticien), préparé par le Secrétariat de la Commission économique pour l'Asie et le Pacifique (ESCAP), propose des changements dans les services statistiques pour maîtriser des problèmes des années 90. Quel devrait-être le rôle des statisticiens officiels en face d'une situation d'expansion des bases de données spécialisées et commerciales?

Le document fut préparé pour le contexte de l'ESCAP mais est également important pour la discussion en Afrique. Un problème commun est certainement la divergence entre la demande croissante des planificateurs et la capacité de la statistique officielle de la satisfaire, en termes de quantité et de qualité. Le document de l'ESCAP, bien conscient des contraintes budgétaires, constate la nécessité d'améliorer l'attraction et la visibilité des services statistiques. Cela inclut l'expansion de l'analyse des données aussi bien que des projections. Aussi, avec le potentiel immense offert par l'utilisation des micro-ordinateurs, les services statistiques devraient profiter des innovations concernant une présentation plus sophistiquée des données. L'amélioration des capacités techniques devrait être accompagnée du développement des capacités de gérer et professionaliser les services, particulièrement à travers la formation des jeunes statisticiens.

LA FORMATION STATISTIQUE AU BENEFICE DES PAYS AFRICAINS DE LANGUE OFFICIELLE PORTUGAISE

I. Introduction

1. Les pays africains de langue officielle portugaise, à savoir la Guinée Bissau, les Iles du Cap Vert, Sao Tomé et Principe, l'Angola et le Mozambique, n'ont accédé à l'indépendance politique qu'en 1975. Ils comptent parmi les pays nouvellement indépendants, et nécessitent de ce fait qu'une assistance spéciale leur soit portée pour la mise en place de structures appropriées dans le cadre de leur développement économique et social.

2. Les pays du groupe, contrairement aux pays africains anglophones et francophones, n'ont bénéficié que de structures embryonnaires de production de données statistiques au lendemain de leur indépendance. Avant 1975 en effet, chacun des pays concernés ne disposait qu'une délégation de l'Institut national de la statistique du Portugal, avec comme principales activités la collecte sur place des données brutes du commerce extérieur et leur acheminement sur Lisbonne pour traitement et analyse.

3. Le besoin de disposer de certaines données statistiques courantes s'est vite ressenti après 1975, lorsqu'il s'est agi d'élaborer, de contrôler et d'évaluer les premiers plans nationaux de développement économique et social. Des services de statistique ont été créés de façon plus ou moins hâtive pour satisfaire ce besoin, avec un personnel composé en partie d'anciens commis des délégations nationales de l'Institut de Lisbonneet en partie d'agents plus ou moins expérimentés et sans formation statistique adéquate. Il s'avérait nécessaire dès lors, que des solutions concrètes soient dégagées en vue de l'organisation de programmes de formation statistique adaptés aux conditions spécifiques des pays du groupe.

II. Premières actions de la CEA, dans le cadre du PFSA, pour la promotion de la formation statistique dans les pays Africains de langue officielle portugaise.

4. C'est depuis octobre 1977 que la dixième session de la Conférence des statisticiens africains avait recommandé qu'une assistance spéciale soit envisagée au bénéfice des pays africains de langue officielle portugaise pour satisfaire leurs besoins en personnel statisticien. Il a été donc décidé, suite à cette recommandation, qu'une priorité soit accordée à la promotion de la formation statistique dans les pays concernés, dans le cadre du Programme de formation statistique pour l'Afrique (PFSA).

5. Deux réunions des responsables des services statistiques des pays du groupe ont été organisées par la CEA de 1979 à 1984, la première du 22 au 25 octobre 1979 à laquelle trois pays étaient représentés : l'Angola, le Cap Vert et la Guinée Bissau; la deuxième exactement un an après, du 20 au 22 octobre 1980, à laquelle un seul pays, le Mozambique, n'était pas représenté.

6. Les premières actions de la CEA à l'endroit des pays du groupe ont été guidées par les conclusions auxquelles était parvenue la deuxième réunion de 1980 à savoir :

- créer et développer des programmes de formation statistique en cours d'emploi dans les pays du groupe,

- créer un centre régional de formation de niveau moyen ou développer le Centre de Lubango, en Angola, et,

- encourager la participation des ressortissants des pays concernés à des cours et séminaires de formation de courte durée.

7. Des actions ont été donc engagées par la CEA dans le sens de la mise en pratique de ces conclusions, lesquelles n'ont malheureusement pas abouti à cause de certaines difficultés rencontrées. Aussi, la troisième réunion des Directeurs des centres du PFSA, tenue à Addis Abéba du 31 octobre au 4 novembre 1983, a-t-elle convenu qu'il fallait mettre l'accent sur des actions de formation au niveau national. Cette nouvelle orientation réaliste donnée au projet a été notée avec satisfaction par la Conférence commune des planificateurs, statisticiens et démographes africains, lors de sa troisième session en mars 1984. Le nouveau programme d'actions issu de cette nouvelle orientation a poursuivi les objectifs suivants :

- sensibiliser les administrations gouvernementales à l'importance de la statistique dans le processus de développement économique et social, et à la nécessité d'implanter un système statistique fiable;

- collecter des informations quantitatives et qualitatives nécessaires pour l'évaluation des besoins en formation statistique dans chacun des pays du groupe;

- rassembler des éléments en vue de l'élaboration d'un programme-type pour la formation statistique en cours d'emploi adapté aux conditions particulières des pays du groupe, et

- aider dans l'organisation, au niveau national, de programmes de formation statistique en cours d'emploi pour le personnel de niveau moyen.

8. Ces nouvelles directives données au projet ont permis à la CEA d'enregistrer des actions positives dans le cadre de la promotion de la formation statistique à l'endroit des pays du groupe. En effet :

- une étude d'évaluation des besoins a été entreprise par la CEA de février à juin 1984, laquelle a permis de réactualiser aussi bien les effectifs du personnel statistique au sein des services nationaux de statistique des pays du groupe, que les besoins de formation statistique desdits pays pour la période 1985 - 1989; l'étude a essayé de dégager des solutions assez concrètes en vue de satisfaire en grande partie les besoins de formation exprimés;

- un programme-type pour la formation statistique en cours d'emploi a été préparé en lanque portugaise par un consultant recruté par la CEA et fourni par l'Institut national de statistique du Portugal;

- des tentatives ont été menées en vue de lancer des programmes de formation statistique en cours d'emploi en Guinée-Bissau, à Sao Tomé & Principe et au Mozambique. Il s'agit dans les deux premiers pays, de l'envoi d'un consultant qui a séjourné trois mois dans chacun desdits pays en vue de lancer le programme, et d'une mission de la CEA au Mozambique pour la rédaction d'undocumentde projet à soumettre aux bailleurs de fonds en vue du financement du programme.

9. Comme on peut le constater, des actions positives ont été menées par la CEA après la troisième réunion des directeurs des centres du PFSA. Ces actions ont permis de jeter les bases pour la recherche de solutions concrètes en vue de la promotion de la formation statistique dans les pays du groupe. Une réunion des directeurs des services de statistique des pays du groupe a donc été programmée par la CEA pour 1987, dans le but de discuter des nouvelles approches pour la mise en place de structures adéquates de formation statistique de niveau moyen au sein des pays du groupe.

III. Actions parallèles de la CEE pour la promotion de la formation statistique dans les pays du groupe.

10. Le Centre européen de formation des statisticiens économistes des pays en voie de développement (CESD) et l'Office statistique des communautés européennes (OSCE) avaient commencé en 1984 à étudier la possibilité de créer un centre de formation statistique pour les pays du groupe sur le modèle du CESD. L'idée a été discutée de manière informelle avec des statisticiens des pays concernés, ainsi qu'avec le Directeur de l'Institut de statistique

du Portugal qui participait en 1985 à une réunion du Conseil d'administration du CESD en qualité d'observateur.

11. Par ailleurs, après l'adhésion du Portugal à la CEE, le gouvernement portugais a décidé de restructurer la statistique dans son pays et a fait appel à l'assistance française pour la création d'une école du type Ecole nationale de la statistique et de l'administration économique (ENSAE) à Lisbonne.

12. De ces deux idées est né le projet de création d'une école de statistique de niveau supérieur à Lisbonne, Portugal, à l'image de l'ENSAE de Paris, au sein de laquelle serait implanté un centre de formation du type CESD-Paris pour la formation, au niveau supérieur, de statisticiens des pays africains de langue officielle portugaise. Une mission conjointe ENSAE- France/OSCE/CESD-Paris s'est rendue à Lisbonne en décembre 1986, en vue de discuter avec les responsables portugais du programme d'implantation des deux structures de formation à savoir l'ENSAE- Lisbonne et le CESD-Lisbonne. La mission a souligné l'un des avantages d'une telle structure à savoir qu'un financement du Fonds européen de développement (FED) pourrait être sollicité pour la composante CESD-Lisbonne. Les grandes lignes du projet de création de l'ENSAE-Lisbonne et du CESD-Lisbonne ont été ensuite arrêtées par les membres de la mission, pour être présentées par la suite aux responsables des directions de statistique des pays du groupe.

IV. Actions conjuguées de la CEE, de la CEA et du gouvernement du Portugal au bénéfice des pays du groupe.

1. Réunion conjointe CEE/CEA des directeurs des services de statistique des pays du groupe à Bruxelles, Belgique

13. Il faudrait rappeler que la CEA avait inscrit dans son programme de travail en matière de statistique pour 1987, une réunion des directeurs des services de statistique des pays africains de langue officielle portugaise. L'objet de cette réunion était de discuter des nouvelles approches pour la mise en place de structures adéquates de formation statistique au niveau moyen au sein des pays du groupe.

14. Entre temps, la CEE avait prévu l'organisation d'une réunion semblable en vue d'informer les mêmes directeurs de services statistiques sur les conclusions de la mission conjointe de Lisbonne, et de discuter de la mise en place, à Lisbonne, du centre de formation statistique au niveau supérieur pour les pays du groupe.

15. La CEE et la CEA, ont convenu d'organiser conjointement une réunion à Bruxelles, afin de discuter de manière intégrée des projets de mise en place de structures de formation statistique aux niveaux supérieur et moyen pour les pays africains concernés. La

réunion de Bruxelles (Belgique) du 19 au 22 mai 1987 a été d'une tres grande importance pour la poursuite des actions de promotion de la formation statistique pour les pays du groupe. C'est à Bruxelles que, pour la première fois, tous les cinq pays de langue officielle portugaise étaient représentés à une réunion pour discuter des voies et moyens pour le développement de la formation statistique.

16. Les conclusions réalistes de cette réunion de Bruxelles ont permis à la communauté internationale de concentrer les efforts sur des projets précis de développement de la formation statistique pour les pays du groupe. En effet :

- Les délégués des cinq pays africains du groupe ont favorablement accueilli le projet de création, à Lisbonne, d'un centre pour la formation de leurs cadres supérieurs en statistique, et ont marqué leur volonté d'utiliser ce centre à cet effet.

- Ils ont unanimement réaffirmé qu'une priorité élevée devra être accordée à la formation des cadres moyens de la statistique pour les pays du groupe. A cet effet, les délégués du Cap Vert et de Sao Tomé et Principe ont manifesté leur volonté d'utiliser la future structure de formation de Bissau pour former leurs cadres moyens.

- La réunion a reconnu la nécessité d'élaborer, pour les pays africains du groupe, un programme-type de formation des cadres moyens de la statistique dans le but d'assurer un développement harmonisé de cette formation au niveau de ces pays. La CEA a été chargée d'élaborer ce programme-type.

- La Commission des communautés européennes, le Gouvernement du Portugal et la Commission économique des Nations Unies pour l'Afrique se sont engagés à conjuguer leurs efforts en vue de promouvoir la formation statistique au bénéfice des pays du groupe.

2. Mission conjointe CEE/CEA/Portugal à Bissau (24 - 27 novembre 1987)

17. Cettemission a été recommandée par la réunion de Bruxelles, dans le but d'étudier la faisabilité du projet de création d'un centre national, à vocation sous-régionale, de formation de cadres moyens de la statistique. Les conclusions de cette mission conjointe ont fait ressortir les principalesactions à mener en vue de l'ouverture de ce centre qui formera, non seulement les ressortissants de la Guinée-Bissau, mais aussi ceux du Cap Vert et de Sao Tomé et Principe.

18. Il est heureux de constater que les différentes actions recommandées par la mission sonten train d'être exécutées, permettant ainsi l'ouverture très prochaine de ce centre de formation dans les locaux du CENFA (Centre de formation administrative), à Bissau. En effet :

- Un accord est intervenu entre le Ministère de l'éducation et celui du plan de la Guinée-Bissau concernant i) la mise à disposition d'une partie des infrastructures du CENFA pour abriter le centre de formation statistique, ii) la mise à disposition d'un bâtiment existant pour loger les étudiants du Cap Vert et de Sao Tomé et Principe après réfection, et iii) l'autonomie du centre vis à vis du CENFA

- La Commission des communautés européennes a donné son accord pour le financement des deux requêtes que lui avait adressées le gouvernement de la Guinée-Bissau, à savoir celle relative à l'assistance techique nécessaire pour l'ouverture du centre, et celle concernant la réfection du logement devant abriter les étudiants du Cap Vert et de Sao Tomé et Principe.

3. Réunion CEE/CEA à Luxembourg (2 - 4 février 1988)

19. Une autre action menée conjointement par la CEE et la CEA, a été la préparation technique et l'organisation de la réunion de Luxembourg, laquelle a rassemblé une fois de plus les représentants de tous les cinq pays du groupe. Son principal objectif a été d'examiner les programmes-types de formation des cadres moyens de la statistique adaptés aux conditions spécifiques des pays du groupe. Comme on l'a déjà indiqué, ces programmes-types ont été préparés par un consultant recruté par la CEA.

20. Parmi les principales conclusions de réunion, il convient de noter que:

- les programmes-types de formation statistique de niveau moyen ont été adoptés sous réserve des amendements sur les cours de mathématiques, de méthodes statistiques et d'informatique;

- s'agissant du projet de création de l'école de formation des cadres supérieurs de la statistique à Lisbonne, la réunion a souligné la nécessité d'associer étroitement les pays du groupe à toutes les phases relatives à la mise en oeuvre de ce projet, y compris la préparation des programmes d'enseignement, la définition des structures et les conditions d'admission.

4. Réunion CEE/Portugal à Lisbonne (7 - 9 novembre 1988)

21. Cette réunion constitue une suite logique des démarches en vue de l'ouverture de l'école de formation des cadres supérieurs de la statistique dans ce pays. Là aussi, tous les cinq pays du groupe ont répondu présents, ce qui témoigne de leur intérêt pour la mise en place de structures adéquates pour la formation de leur personnel statisticien.

22. Le principal objectif de la réunion a été d'examiner la situation du projet de création de l'"Institut national supérieur de statistique appliquée" (INSSA) de Lisbonne, du point de vue de sa structure, ses programmes d'enseignement, et ses conditions d'admission. C'est ainsi que les grandes lignes des discussions et conclusions de cette réunion ont été les suivantes :

- La nouvelle école est officiellement dénommée : "Institut national supérieur de statistique appliquée" (INSSA). Son institution officielle rentre dans le cadre de la reformulation du système statistique au Portugal, dont la loi a été votée récemment par le Parlement. Cette loi a prévu aussi que l'INSSA comportera un centre de formation des élèves originaires des pays africains de langue officielle portugaise, lequel sera sur le modèle du CESD- Paris et sera dénommé CESD-Lisbonne. L'ouverture des premières promotions de l'INSSA et du CESD-Lisbonne était prévue pour octobre 1989.

- Il a été admis que le CESD-Lisbonne bénéficiera d'un statut autonome vis-à-vis de l'INSSA, mais que son Directeur fera partie des organes de gestion de l'INSSA. Par ailleurs, il a été admis que l'accès à l'INSSA et au CESD-Lisbonne se fera sur la base de concours, bien que cela ne soit pas d'usage dans les universités portugaises.

- Les programmes d'enseignement élaborés par l'Institut national de statistique du Portugal pour les deux cycles de formation de l'INSSA, ont été examinés dans leur grandes lignes par la réunion. Ceux-ci s'inspirent des programmes en vigueur au CESD-Paris et à l'ENSAE-Paris, ainsi que des programmes-types de la CEA pour la formation de niveau supérieur.

- De longues discussions ont concerné les conditions d'admission des ressortissants des pays africains de langue officielle portugaise aux deux niveaux de formation de l'INSSA. Un premier point : l'accès se fera par la voie de concours quelle que soit la nationalité du candidat. Les candidats au cycle des cadres supérieurs de conception de la statistique (CSCS) seront recrutés parmi a) les détenteurs de licence en divers

domaines, plus spécialement en économie, génie et mathématiques; b) les étudiants en dernière année de licence, sous réserve de l'obtention du diplôme à la fin de l'année universitaire; c) les détenteurs du diplôme de cadres supérieurs d'application de la statistique (CSAS). Quant aux candidats au cycle des cadres supérieurs d'application de la statistique (CSAS), ils seront recrutésparmiles détenteurs du baccalauréat ou d'un diplôme équivalent. La réunion a recommandé d'inclure les étudiants inscrits au baccalauréat sous réserve de l'obtention du diplôme en fin d'année scolaire, de même que les adjoints techniques diplômés des centres de Bissau, de l'Angola et du Mozambique qui auraient au moins un an d'expérience professionnelle.

V. Conclusions

23. Après quelques actions lancées au début dans la recherche de moyens propices au développement de la formation statistique dans les pays africains de langue officielle portugaise (1978 à 1983), la CEA a commencé par enregistrer des résultats positifs lorsque de nouvelles directives ont été adoptées à cet effet par la troisième réunion des Directeurs des centres du PFSA. Il convient de citer plus spécialement l'étude élaborée en 1984 sur les besoins de formation statistique dans les pays du groupe, qui a fourni des estimations chiffrées sur lesquelles se sont fondés tous les projets ultérieurs de promotion de la formation statistique pour les pays concernés.

24. Mais il convient de souligner que le projet d'assistance aux pays africains de langue officielle portugaise dans le domaine de la formation statistique est en voie de réalisation grâce aux actions conjuguées des pays et organismes intéressés, en l'occurence le Gouvernement du Portugal, l'Office statistique des communautés européennes (OSCE) et la CEA. Il est à souhaiter vivement que cette conjugaison des efforts puisse se poursuivre jusqu'à la mise en place définitive de structures solides de formation statistique au bénéfice des pays du groupe.

STATISTICAL TRAINING FOR PORTUGUESE-SPEAKING AFRICAN COUNTRIES

(SUMMARY)

The paper gives highlights on activities undertaken by ECA and other institutions such as the Government of Portugal and the European Economic Community (EEC) for the development of statistical training facilities for the benefit of Portuguese-speaking African countries.

The main activities carried out by ECA on this subject during the period 1979-1985 within the framework of the Statistical Training Programme for Africa (STPA) are briefly indicated: two meetings of directors of statistics of the Portuguese-speaking African countries have been organized; the statistical training needs of the countries of the group have been assessed; a guide syllabus, in Portuguese, for in-service statistical training has been prepared; etc... The relevant actions taken from 1984-1986 by the Statistical Office of the European Communities (SOEC) and the European Centre for Training of Economist/Statisticians from developing countries (CESD) are also mentioned. In particular consultations were held on the possibility of setting up a professional level statistical training centre for the countries of the group in Lisbon.

The last section of the paper describes the main actions undertaken jointly by EEC, the Government of Portual and ECA during the last three years leading to projects for the establishment of two statistical training centres for the benefit of the countries of the group, one a Lisbon, Portugal, for professional level training and the other at Bissau, Guinea Bissau, for middle level training.

RESEARCH AT CENTRES PARTICIPATING IN THE STATISTICAL TRAINING PROGRAMME FOR AFRICA (STPA) CENTRES: SELECTED ISSUES

I. Introduction

1. It should be recalled that the STPA was adopted at the tenth session of the Conference of African Statisticians in October 1977 and was formally approved by resolution 9ECO(XVIII) of the ECA Executive Committee at its eighteenth session which was held in Khartoum (Republic of Sudan) in 1978.

2. The main objective of the STPA is to ensure that the African region has a permanent supply of qualified statistical staff for the National Statistical Offices (NSOs) and other organizations in the public as well as the private sector. The STPA is co-ordinated by ECA at the regional level.

3. As of 1989, fifteen regional statistical training centres had been admitted to the programme. In addition eight centres outside the African region were associated with the programme. It should be noted that at its inception, STPA had twelve (12) ordinary and one associate member. The associate centres were to provide mainly short-term training in the form of courses, seminars or workshops in specific applied statistics topics for serving statisticians while STPA centres were to provide professional level training leading to the first degree in statistics or equivalent, specialised and post-graduate level training and middle level training. A complete list of STPA and associate centres is provided as Annex I to this paper.

4. Within the framework of the STPA, research work has been included as one of the activities to be encouraged at STPA centres. In particular research at STPA centres, involved in post-graduate statistical training, was to be encouraged and, adequate emphasis to training wa to be given.

5. The issue of research at STPA centres was first discussed within the framework of the STPA at the second meeting of Directors of STPA centres which was held in Addis Ababa, Ethiopia from 2-6 November 1981. At this meeting Directors or representatives of STPA centres gave examples of research work that had been done at their centers including the mode of financing and their plans for the future. It was recognized at that time that not all STPA centres were in a position to conduct research. The main reasons were that some of the centres operated primarily middle level training and where degree programmes existed the

necessary facilities for conducting research including adequate staff were lacking. Against this background, under the UNDP financing, ECA has provided training of trainers fellowships to some of the teaching staff at STPA centres. These trainers study for masters and doctorate degrees in specific fields of theoretical and applied statistics. The trainers are in addition to teaching expected to conduct research in their specific fields when they return to their centres.

ii. What is research?

6. Research has been commonly defined a systematic investigation towards increasing the sum of knowledge. Within the framework of STPA, the term includes descriptive statistical analysis, in-depth statistical analysis involving such methods as multivariate analysis, modelling and tests of hypothesis. This approach was not only desirable but also practical. Research at STPA centres covers inter-alia

i) Student projects either at sub-degree or degree levels;

ii) Student graduate research (Masters or Ph.d);

(iii) Post-doctoral research;

(iv) Staff research (individual or collective);

(v) Other activities such as consultancies, etc.

III. The need for research

7. There is great need for STPA centres to conduct research. It should be mentioned at the outset that for the English- speaking STPA centres located at Universities, conduct of research is an institutional requirement. The same may be true of French-speaking STPA centres which provide courses at the "Ingénieur des travaux statistiques" and "Ingénieur statisticièn économiste" levels. Research publications help to enhance academic reputation of individual teachers and professors while at the same time improving their career prospects. The reputation of the institution in which high quality research is undertaken is also boosted.

8. Research at STPA centres is also needed to enable the study of the applicability of statistical methods. Thus some of the research work consists of applying these methods to African conditions and helping to develop adaptations in certain cases which are more suited to conditions in the region or in individual countries.

9. Although the main function of the STPA centres is teaching leading to the award of diplomas, degrees, etc. to the students, the role of research in a training institute is now fully recognised. Every teaching institution is now aware that research is part of its work-programme to illustrate methods being taught in specific fields and also to keep trainers and trainees become up-to-date with existing techniques and their limitations in the practical field. Knowledge has to be updated and improved upon with time and this can only be done through well planned and in-depth research.

10. Research can attract government and donor financing including private sector financing. To be able to do this, research designs should be carefully prepared. The acquisition of vehicles, equipment such as micro-computers, typewriters, photocopy machines, etc. should not be a main objective of any research project. Such non-expendable equipment should be included in a research project if they are needed for project implementation. The important thing is to come up with research projects which donors are likely to finance because the research findings are likely to be useful to the countries served by the training centre. Theoretical research in Africa has not yet started to attract generous funding.

11. Through research, the training centres can establish links with other institutions particularly if their research interests are similar. Through such institutional linkages, exchange of professors and organization of research seminars can take place. Such exchanges could cover methodological research, results of comparative analysis etc.

IV. Types of research

12. Statistical research can broadly be divided into two types namely theoretical and applied research. Theoretical research involves the development of theory or models based on assumptions which in a real life situation may or may not hold. Applied research on the other hand involves the testing of theoretical results on real life or other data or the application of statistical methods to data. This type of research sometimes involves the collection of data from the field through a survey or experiment.

13. Some projects involve a combination of the two types of research. Methodological research usually covers both types of research. First the development of a theoretical model is undertaken followed by the testing of the model using real life on other data. In the latter case data may be generated through the use of random number generators or other methods and is used to test the theoretical model.

14. Applied research topics may include the broad areas of demographic and social statistics, economic and related statistics, data processing, quality control, sampling techniques, agricultural statistics, etc. while theoretical research areas may include distributions, statistical inference, queueing theory, stochastic processe , etc.

V. Problems associated with Research Activities at STPA centres

15. The problems associated with research activities at STPA centres cover academic staffing of the STPA centres, teaching workload of staff, funding of research activities, research facilities etc.

16. On the academic staffing of the STPA centres, this has been a chronic problem. To enable staff devote some of their working time to research, the staffing requirements of a centre should take account of the fact that a certain proportion of trainers' time will be devoted to research. Due to financial and other problems, this is not done with the result that there are few at most of the STPA centres. Most of the STPA centres have also suffered from problems of brain drain of their academic staff. Also there have been in some countries, transfers of STPA centres staff to the civil service or parastatal organizations. Without a proper replacement of the staff at the STPA centre the brain drain disrupts the research activities of the centre.

17. The regional component of the STPA which is funded by UNDP has so far trained twenty six trainers at STPA centres under the training of trainers fellowships. Training is a large investment by both the institution and the UNDP. It is expected therefore that these staff will return to their centres and stay there long enough to contribute to the development of the teaching and research activities.

18. Closely related to academic staff and research is the teaching load of each staff member. If the academic staff are few and the teaching load heavy, the staff are likely to devote a lot of their time to teaching and very little time will be left for research. It is therefore important for each STPA centre to examine the work-load of each staff member in terms of teaching hours and ensure that the staff member has time to devote to research.

19. Most of the STPA centres have had problems in securing funding for research. In a few cases, again depending on the research topic, donor agencies, the government or the private sector in the country have provided the necessary funding. Because of the lack of funding, the majority of the STPA centres have conducted limited

applied research. While theoretical research may not attract funding, applied research requires funding in the form of vehicles, payment of field and office research staff, field allowances etc. In some cases equipment has to be acquired from abroad and in this case there is need for foreign currency to purchase this equipment.

20. Inadequacy of research facilities such as micro-computers and related software, well equipped library with reference materials such as journals and textbooks etc., have hampered research at STPA centres. However, a few donor agencies have provided textbooks and equipment such as micro-computers to some STPA centres. The regional component of the STPA which is funded by UNDP through the Statistical Development Programme for Africa project, and is executed by ECA has provided equipment such as micro-computers, photocopy machines and duplicating machines to some STPA centres to be used mainly for teaching purposes. The same equipment can also be used for research.

VI. Improvement of Research Activities at STPA centres

21. The issues to be discussed in this section include training of trainers at STPA centres, determination of research priorities, teaching load of the staff, twinning/linkage of STPA centres with other institution, provision of funding, provision of adequate research facilities and organization of meetings to discuss research design and findings.

22. ECA through funds provided by UNDP is already assisting some STPA centres in training their trainers. The training being provided to the trainers is usually to enable them to obtain higher degrees. However, since the training awards are usually tenable at institutions with a long history of research it is hoped that the trainers would also acquire the necessary background not only to assist their trainees to carry out research but also to use part of their own time to conduct relevant research. It is expected that these donors who have been providing assistance directly or indirectly to research will continue to do so and that other donor agencies will continue their assistance in the training of trainers at STPA centres.

23. As part of the effort to improve research activities at STPA centres, there is need for each STPA centre to define its research priorities. Such priorities need to be disseminated widely to institutions and donor agencies. Donors may, following receipt of such information, express their interest in financing some of the research or their participation technically in the specific research projects. Other institutions may explore ways and means of collaborating with the institution on specific research efforts.

24. Regarding the teaching load of staff there is need for STPA centres to examine this and ensure that it is not too heavy. The heavy load of teaching at STPA centre is usually caused by the small number of staff compared to the required number due to various reasons. Before embarking on extensive research projects which would improve the research activities, STPA centres need to address this matter seriously. This is because trainers with very heavy teaching loads cannot reasonably be expected to carry- out any meaningful research or to supervise adequately trainees undertaking research.

25. Twinning/linkage of STPA centres with other institutions within or outside Africa can promote co-operation in specific research projects in addition to teaching. The 'EEC assistance project to STPA' is already promoting the twinning/linkage, some of the English-speaking STPA centres. Such twinning/linkage which in the EEC context is meant to promote academic co- operation between an STPA centre and a relevant European statistics centre housed in a university environment, could be used as a basis for strengthening research in the centres. This can be done in two ways; by sending a trainer from one centre to do research including postdoctoral research especially during the trainers' sabbatical year or by seconding an experienced trainer from the corresponding institution to supervise some research projects or merely to participate in a research project being undertaken by the STPA centre.

26. Provision of financial assistance by donor agencies and other organizations would go a long way in improving research activities at STPA centres. Donor agencies are usually interested in financing activities which are of interest to them. STPA centres should therefore be conscious of this and see which of their research priorities coincide with those of the donors and try to formulate projects which will attract donor funds. In Africa, there are currently limited research funds (government or private) which institutions could access by making specific applications for them. It is likely that it will take time for such research funds to be freely available and thus dependence on funding sources outside Africa such as the Rockefeller or Ford Foundation is likely to continue for sometime to come. It should be noted in this case that some African governments are already providing some funds for research projects at the STPA centres located in their countries.

27. Meetings (seminars or workshops) to discuss various aspects of research activities at STPA centres could lead to the improvement of research. Such meetings should be organized by STPA centres. ECA and other organizations could be invited to participate and to assist in their preparation and donor agencies could be approached to finance them. In addition to these large meetings, in-house seminars could be encouraged at each STPA centre on a weekly/monthly basis to enable teachers or students present their research findings and get comments from their colleagues.

VII. Dissemination of research findings

28. The issue of dissemination of research findings was raised at the fourth meeting of Directors of STPA centres held in Addis Ababa, Ethiopia in November 1985. It was suggested at that meeting that the ECA secretariat should consider publishing a digest of research conducted at African statistical training centres. The meeting concluded that the publication of such a digest was premature at that stage in view of the fact that there was not enough research at the various centres to sustain the publication of a digest on a regular basis. It was proposed that the ECA secretariat should publish occassional research news presumably in the regular STPA news. In this connection, it should be noted that the African Statistical Association (AFSA) also plans to publish a scientific journal and at present there is no justification for two different publications in the same field.

VIII ECA Survey on the Status of Research Activities at STPA Centres

29. Some of the research subjects covered in African statistical training institutes include determination of socio-economic correlates of fertility by multivariate analysis application of profile analysis to country data, examination of relative merits of alternative indirect estimation of mortality, more efficient ratio estimates and statistical tests involving improved seedlings in agriculture.

30. A survey on the status of research activities at STPA centres was conducted by ECA between February and June 1987. A mail questionnaire was sent to all 15 STPA centres soliciting information on research activities which the centre undertook during the period 1982-1986. The survey achieved 80 per cent response rate which is considered satisfactory. The full details of the results were presented to the fifth meeting of Directors of STPA centres in Addis Ababa, Ethiopia from 26-30 October 1987.

31. The results of the survey showed that out of the twelve STPA centres which responded, ten centres conducted research during the period 1982-1986, one Centre did not conduct research while at one centre students carried out surveys which were regarded by the centre not to be of the research nature but were meant for teaching purposes only. Regarding plans for research, eight centres indicated their plans, one centre had not planned its research as yet, two centres had not supplied details of their research plans and one centre was in the process of planning its research.

32. There was a wide range of research activities which were undertaken during the period 1982-1986 at STPA centres. Some of the research activities were continuing. Below is a summary of the subjects and main topics of research which were undertaken:

i) Demographic and social statistics:

Fertility and its determinants, mortality, migration, estimates and projections, health and housing surveys, population and housing censuses and value of children, faculity studies, school attendance;

ii) Economic and related statistics:

Trade statistics, basic economic statistics and national accounts, economic activity and growth, international comparison of prices, input-output modelling, econometric models and subsistence production in national accounts;

iii) Data processing:

software for statistical work on micro-computers and data processing for surveys;

iv) Industrial statistics:

structure of handicrafts, energy surveys, industrial developments forecasts and industrial establishments and surveys;

v) Agricultural statistics:

food production and forecasting, wood and furniture surveys, fishing,food balance sheets, design and analysis of surveys and experiments, food consumption surveys and land tenure;

vi) Sampling techniques:

non-response in surveys, methodology of household surveys, ratio estimators and master samples;

vii) Theoretical statistics:

distributions; multivariate, bivariate, beta and gama; statistical inference, queuing theory, markov chains and stochastic modelling;

viii) Other:

programme implementation and evaluation, use of spare time surveys, accident statistics, banking and finance statistics, official statistics and national statistical systems.

33. Regarding the research activities which were planned to be undertaken by the STPA centres from 1987 onwards, the following is the summary of the subjects and main topics of research which had been planned to be undertaken:

i) Demographic and social statistics: fertility and mortality, migration, interrelationship of demographic and social statistics and demographic surveys;

ii) Economic and related statistics: econometric models and integrated planning models;

iii) Agricultural statistics: problems of agricultural surveys and cluster models;

iv) Sampling techniques: sampling errors of fertility rates;

v) Thecretical statistics: Queues, multivariate techniques and classification and stochastic models in weather forecasting, education and manpower;

vi) Other: Practical quide for surveys and analysis of surveys, processing of completed questionnaires, informal sector study, statistics of accidents, graduation of weights of human beings and small scale brick making.

IX. Research in the field of Agricultural Statistics

34. Research in the field of agricultural statistics has been discussed extensively in many conferences, seminars and workshops in the African region and elsewhere. In this section some of the issues on research in the field of agricultural statistics which were discussed at two Commonwealth workshops on Food Supply Information Systems in Africa will be highlighted. The first workshop was held from 13-25 October 1986 in New Delhi, India and the second workshop was held from 13-17 March 1989 in Nairobi, Kenya. These workshops were convened in pursuance of the recommendations made by the Commonwealth Agriculture Ministers and were a follow-up to the report of the Commonwealth Action Group on the Economic Crisis in Africa.

a) Commonwealth Workshop on Food Supply Information System in Africa, 13-25 October 1986, New Delhi, India

35. At this workshop the participants focused on the institutional as well as the methodological aspects of food supply information systems. The workshop was attended by representatives of 12 Commonwealth countries (Botswana, Gambia, Ghana, Kenya, Lesotho, Malawi, Nigeria, Sierra Leone, Tanzania (2 representatives), Uganda, Zambia and Zimbabwe) and two representatives of

academic/research institutions in Africa, ISAE, Uganda and Department of Statistics, University of Ibadan, Nigeria.

36. The workshop considered the need for a programme of research and experimentation which would identify appropriate procedures and methods for the collection of crop areas and yield and livestock statistics in Africa using the objective technique. The objective technique involves physical measurement of the characteristics under study using scientific methods. These methods usually involve sampling due to the fact that they are time-consuming. Their correct application requires a cadre of disciplined, conscentious and skilled enumerators and close supervision.

37. It was established at this workshop that the production of agricultural statistics in Africa was affected by a number of methodological issues. The experience in India in at least the last 40 years indicated the need for an on-going programme of research and experimentation in order to address these methodological problems and also to compare different methods and techniques currently in use in different parts of Africa. It was suggested that such research could best be undertaken on a regional/sub-regional basis in order to be cost effective.

38. Two English-speaking teaching and research institutions which were represented at the workshop were identified as appropriate regional centres to conduct such research and experimentation. The institutions are the Institute of Statistics and Applied Economics, Makerere University, Uganda and the Department of Statistics, University of Ibadan, Nigeria. It was mentioned that other interested statistical institutions in the African region could also assume this responsibility.

39. The Programme of research and experimentation was to be preceded by a baseline study, to be conducted in African countries, with the purpose of documenting African experience for the collection of agricultural statistics. The Commonwealth Secretariat was requested to facilitate this. This survey was carried out in 1988.

40. Mention was made of the fact that such a programme of research requires close co-operation and collaboration between teaching and research institutions and National Statistical Offices as well as a machinery for dissemination of research findings.

41. The workshop identified possible topics for research and experimentation work. These topics were to be further discussed and refined at the second workshop which the workshop recommended. The second workshop was to be organized by the Commonwealth Secretariat following the conduct of the baseline study. The research topics* are as follows.

Survey design

- Appropriate sample design in African circumstances.
- Use of household-based, as well as area-based frames to draw the sample for crop and yield estimation surveys, including investigations to ascertain status of land records to facilitate the latter.
- Relationship of the sample designs for crop and yield estimation surveys with those for other surveys.

Crop areas

- Methodological problems associated with different cropping patterns and the need to establish appropriate norms and conventions on basic topics.
- Comparative analysis of objective versus subjective methods.
- Various types of equipment available for physical measurement techniques.
- Appropriate quality control measures.

Crop yields

- Methodological problems associated with different cropping patterns and the need to establish appropriate norms and conventions.
- Types of cuts - shape, size and location to be adopted.
- Crop calendars.
- Various types of equipment available for physical measurement techniques.
- Appropriate quality control measures.

Livestock

- Livestock census.

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* These topics are found on page 56-58 of the report of the Commonwealth workshop on Food Supply Information Systems in Africa, New Delhi, India, 13-25 October 1986.

Crop forecast and early warning information system

- Comparative study of various available systems for forecasting crop production.

- Study of objective versus subjective measurement of both the dependent (area/yield) and the independent variables such as bio-metric measurements and agro-related variables including identification of such variables.

- Development of appropriate forecasting models.

Integrated sample surveys

- Investigation into how agricultural statistics can be integrated into the national sample survey programmes.

Institutional arrangements and co-ordination

- Ascertain the extent to which local administrative functionaries at the ultimate level of the administrative hierarchy can be used for execution of field work.

- Identify a central agency which should co-ordinate the above survey programme.

Training

- Ascertain the scope and structure of an appropriate training programme to promote objective measurement techniques and create a pool of trained manpower in each country, and how it could be facilitated within the terms of reference of STPA.

42. In addition to the proposed topics of research, the workshop made specific recommendations on the programme of research, experimentation and training as follows:

- A comprehensive programme of research and experimentation and training (as per the above list of topics) should be agreed upon at the proposed workshop to be held in Africa;

- Such a programme of research, experimentation and training should be facilitated by any necessary formal twinning/linkage arrangements between some Indian institutions engaged in this kind of research, experimentation and training and the institutions in Africa;

- ECA should facilitate this arrangement within the framework of STPA;

- The programme should be drawn up in consultation with the countries willing to host the experiments; and

- The proposed workshop should consider funding support that may be required to implement this programme.

b) Commonwealth Workshop on Food Supply Information Systems in Africa 13-17 March 1989, Nairobi, Kenya

43. This workshop was organized in Africa following a recommendation of the New Delhi workshop. The workshop was timed to take place after a baseline study to document African experience in the area of research and experimentation in the field of agricultural statistics had taken place. This baseline study was conducted by two United Nations Statistical Office consultants, during 1988, in eight (8) African countries namely, Botswana, Ethiopia, Kenya, Lesotho, Malawi, Tanzania, Zambia and Zimbabwe.

44. The workshop was attended by sixteen African countries (Benin, Botswana, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Nigeria, Sierra Leone, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe). The Statistical Office of the European Communities, UN Statistical Office, UNECA, FAO and the Commonwealth Secretariat were also represented.

45. In the area of policy-oriented research, the baseline study revealed the following:

i) Most National Statistical Offices (NSOs) failed to incorporate research and experimentation in their work-programmes;

ii) Most NSOs lacked methodology divisions/sections or failed to recruit methodology specialists; and

iii) Many NSOs adopted or modified survey designs without prior research and experimentation.

46. The baseline study also revealed that some ad hoc research had been conducted at NSOs (e.g. Lesotho, Tanzania) mainly by experts funded from donor agencies and international organizations.

47. A number of issues were raised concerning research in this field. On determining possible institutional linkages, the following factors were mentioned for consideration: limited number of methodology specialists at NSOs, cost-effectiveness and need for co-ordination and linkage with relevant training programmes. The need for countries to host the experiments within the framework of

their ongoing field activities, making research work part of the NSOs work-programmes and involving local experts in any research programme, was expressed.

48. Concerning research funds, it was stated that these are not easy to come by and that donor technical and financial assistance was required. One solution of getting research done was that of tying it up to statistical projects in some cases. It was pointed out that, as reflected in the scope and content of some of its technical studies which it had published and was currently pursuing, the role of the central co-ordinating unit of the NHSCP does not preclude research. The need to carry out research at the national level and to develop capability at this geographical level was emphasized. It was also necessary to set up research priorities. Three areas of research were indicated as of great priority namely, objective versus subjective methods, use of household lists versus area frames and crop forecasting methodology.

49. On institutional co-ordination. It was pointed out that STPA centres could constitute sub-regional foci for institutional co-ordination of the research programme by ECA. The STPA centres would then co-ordinate with countries hosting the experiments in their sub-region.

50. The workshop identified the following priority areas for further research and experimentation.

Sampling design and estimation

- Use of combined area and household sampling frames;
- Extent of the loss of precision arising from the use of administrative units as strata;
- Sample rotation within National Master Sample (NMS) frameworks;
- Synthetic estimation to obtain disaggregated data where resources do not permit sample enlargement;
- Use of supplementary information (e.g. information on total number of households) to reduce the sampling errors of estimates;
- Crop production and forecasting.

Crop areas

- Methodological problems associated with crop production estimation, cropping patterns and the need to establish appropriate norms and conventions.

- Various types of equipment available for area measurement techniques.

Crop production

- Methodological problems associated with crop production estimation, cropping patterns and the need to establish appropriate norms and conventions;

- Comparative analysis of objective and subjective methods with the view of establishing a stable relationship between the two methods. This relationship can be used to calibrate farmers estimates;

- Types of cuts, shape, size and location to be adopted under different cropping patterns and plant densities;

- Establishment of crop calendars;

- Various types of equipment available for physical measurement techniques;

- Data collection on root crops which for many countries constitute the main staple food.

Crop forecast and early warning systems

- Identification of critical variables required for crop production and forecasting;

- Study the effects of these variables on crop production.

- Study appropriate crop forecasting models including a regression analysis of the relationship between crop yield and water balance index (WBI).

Others

- Study of social and food accounting, including the preparation of Food Supply and Utilization Accounts;

- Study of econometric models to facilitate making demand and supply projects as well as building agricultural production functions;

- Study of agricultural prices (construction of index numbers of the parity between prices received by farmers and prices paid by farmers);

- Study of the main sources of non-sampling errors.

51. The following were the recommendations made by the workshop on policy-oriented research.

- FAO and other international organization should embody more research in their projects if they cannot fund research directly.

- Countries should build special research components wherever possible into their work programmes. It is however likely that these will require donor support, especially in view of the limited manpower and budgets in many countries. Local expertise must however be used wherever possible, and every precaution must be taken to ensure institutionalisation.

- Whatever research work has been done in individual countries should be disseminated using for example the STPA Newsletter.

- Priorities for proposed research programmes should include:

i) improved methods of crop forecasting and early estimates,

ii) improved methods of estimation of crop production,

iii) efficiency of farmers estimates as against crop-cutting,

iv) sensitivity of policy decisions to error in the data,

v) efficient sample design, use of remote sensing etc.

- Previous research experience (particularly in India) should be accessed and adapted where appropriate to African conditions.

- ECA in collaboration with FAO and the UN Statistical office should look for funds to support this programme and co-ordinate it.

- In implementing the programme existing institutions should be used.

- ECA is requested to prepare a paper on research in the field of agricultural statistics for the sixth meeting of Directors of STPA centres which will also serve as an input for the sixth session of the Joint Conference of African Planners, Statisticians and Demographers.

c) Comments on research proposals and recommendations of the above two workshops

52. Clearly the Nairobi workshop was expected to examine the research proposals/topics which were made at the New Delhi workshop and incorporate new areas if any. It should be noted that the Nairobi workshop list of research topics did not include topics on livestock, integrated sample surveys, institutional arrangements and co-ordination and training which were clearly specified in the New Delhi workshop research topics.

53. The research topics which were proposed at the Nairobi Workshop must have taken into account the results of the baseline study which was conducted in eight African countries. Thus some of the topics which may have been proposed at the New Delhi Workshop may have been left out at the Nairobi Workshop because they were considered not to be problem areas according to the results of the baseline study. If one accepts this, then one can take the Nairobi list of priority research topics as the one to be used in any future follow-up action.

54. On the conduct of the research itself the two workshops discussed extensively the issues of financial support for the research, institutional framework and co-ordination (regional/national level) of African training and research institutions. Consideration was also given to the countries which will host the experiments, twinning/linkage arrangements between Indian institutions engaged in this kind of research and institutions in Africa to be facilitated by ECA within the framework of the STPA. The issue of methodology specialist at the NSOs to conduct research and experimentation was also discussed. Having discussed the above issues, it was not clear when this research would begin and which countries would work closely with each STPA centre.

55. It should be observed that whereas the New Delhi Workshop identified two English-speaking teaching and research institutions as appropriate to conduct this research, the Nairobi Workshop was of the view that STPA centres should constitute sub- regional foci for the institutional co-ordination of the research programme. In theory at least, all STPA centres should be involved but there is need to have a core of STPA centres which will be charged with this responsibility particularly if account is taken of the teaching activities at their institutions. Those teaching institutions which do not conduct teaching in agricultural statistics may not be in a position to conduct or co-ordinate research in this field. Once appropriate centres have been identified for the conduct and co-ordination of research there is need to allocate to them countries which will
host the experiments.

56. Concerning the recommendations which were made at the above workshops, in particular those recommendations which affect ECA's work, the following comments are relevant:

a) At the Sixth meeting of Directors of STPA Centres, Addis Ababa, Ethiopia, 4-8 December 1989, the Indian Agricultural Statistics Research Institute (IASRI), New Delhi, India was admitted to become the eighth associate centre of STPA. This will enable STPA centres to arrange twinning/linkage with this institution.

b) Concerning the funding of the programme of research, ECA in collaboration with FAO and the UN Statistical Office were requested to look for funds to support the programme and co-ordinate it. It is not easy to look for funds for this kind of programme as was discussed at the Nairobi workshop. It is however thought that through the biennial meetings of Directors of STPA centres and the Joint Conference of African Planners, Statisticians and Demographers at which various donors participate, it is possible to interest some of these donors to finance this research. In this connection ECA was prsentes a paper on research at the sixth meeting of Directors of STPA centres highlighting issues discussed at the New Delhi and Nairobi Commonwealth Workshops. It should be noted in this case that funding for research is already taking place in some countries through bilateral or multilateral donors. What countries ought to do is ensure that their statistical projects in the field of agricultural statistics include elements of research. Donors could also insist on the conduct of some research for the projects which they finance.

c) On the dissemination of research findings, ECA is prepared to publish occasional news on research which countries or STPA centres may forward to it for publication. A separate section in the STPA Newsletter could be established for this purpose to enable the dissemination of this news.

d) Longacre methodological study on comparison of subjective and objective methods

57. The Longacre agricultural development centre in the United Kingdom carried out in 1987 a methodological study in six African countries namely: Benin, Central African Republic, Kenya, Mali, Niger and Zimbabwe. This study was financially supported by the World Bank.

58. The study arose out of worries about crop-cutting in various parts of the world and some studies conducted in Nigeria and Zimbabwe which suggested the possibility of subjective methods to measure agricultural production.

59. The primary objective of the study was to 'test the hypothesis that under certain conditions of fairly general relevance, estimate of production obtained by interviewing farmers soon after harvest can be at least as accurate as any estimate obtained through physical measurement involving crop-cutting on sample sub-plots'. The results of the study were as follows:

a) Farmers' post-harvest estimates are superior to estimate obtained by objective measurement both in terms of predicting the average value and having smaller variance;

b) Farmers' pre-harvest estimates obtained a short time before harvest are also good for predicting production levels but are subject to significantly greater variance although the estimates obtained earlier are not so good for the said purpose; and

c) Estimates based on square-cuts seriously over-estimate yield.

60. While the study was said to have had several weaknesses such as those of sample size, investigation of only one crop etc. the results of the study were however thought useful in themselves and that with further exprimentation they could be improved upon.

61. The Nairobi Commonwealth Workshop discussed the results of the study and came up with the following conclusions:

a) The findings of the study were at variance, not only with the empirical findings in India but also with the general theory of survey errors. There was need to look for reasons why crop-cutting method should give such large over-estimates. Good training of enumerators and proper supervision were some of the ways of eliminating errors which go with the crop cutting method. The workshop concluded that there is need to conduct further research to determine the sources and magnitude of these errors with a view to controlling them.

b) There are dangers in placing total reliance on farmers' estimates, the reliability of which may vary according to circumstances. In particular the calibration of local measurements is an essential ingredient of the method. African countries were therefore cautioned not to rush into adopting the farmers' estimate method. This method should be further examined in as many countries of the region as possible.

c) Countries using crop-cutting methods were urged to make use of farmers' reports and vice versa. Resources should be made available to analyse data from farmers' interviews which have accumulated over the years in some of the NSOs in the region.

d) There was evidence of commercial farmers being able to estimate total production reasonably well as had been observed by FAO.

62. Clearly the Longacre study is one example of a research and experimentation effort into the methods of collecting data on crop production. Other efforts will no doubt follow in the near future in the respective countries.

X. Conclusion

63. The paper has attempted to describe selected issues on research at STPA centres such as the need for research, types of research and problems associated with research activities. Consideration has also been given to the dissemination of findings, improvement of research and the ECA 1987 survey on the status of research activities at STPA Centres. The highlights of the discussions on research in the field of agricultural statistics which took place at two Commonwealth Workshops on Food Supply Information Systems in Africa have been summarized in this paper.

64. It is hoped that issues which have been raised in this paper will lead to further discussions and actions in the field of research at STPA centres.

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ANNEX I

ANNEX

STPA AND ASSOCIATE CENTRES

(a) STPA Centres

(i) English-speaking centres

- Department of Statistics, University of Botswana, Gaborone, Botswana.
- Department of Statistics, University of Ghana and Institute of Statistical Social and Economic Research (ISSER), Legon, Ghana.
- Regional Institute for Population Studies (RIPS), University of Ghana, Legon, Ghana.
- Department of Statistics, National University of Lesotho (NUL), Maseru, Lesotho.
- Department of Statistics, University of Ibadan, Ibadan, Nigeria.
- Eastern Africa Statistical Training Centre (EASTC), Dar-es-Salaam, United Republic of Tanzania.
- Institute of Statistics and Applied Economics (ISAE), Makerere University, Kampala, Uganda.

(ii) French-speaking centres

- Institut national de la planification et de la statistique (INPS), Ministère de la planification et de l'aménagement du territoire, Alger, Algérie.
- Institut de statistique de planification et d'économie appliquée (ISPEA), Yaoundé, Cameroun.
- Ecole nationale supérieure de statistique et d'économie appliquée (ENSEA), Abidjan, Côte d'Ivoire.
- Centre européen de formation des statisticiens économistes des pays en développement (CESD), Paris, France
- Institut africain et mauricien de statistique et d'économie appliquée (IAMSEA), Kigali, Rwanda.
- Collège statistique, Ecole nationale d'économie appliquée (ENEA), DAKAR, Senegal.

- Institut national de statistique et d'économie appliquée (INSEA), Rabat, Maroc.

- Institut de formation et de recherche démographiques (IFORD), Yaoundé, République du Cameroun.

(b) Associate Centres

- International Statistical Programs Centre (ISPC), United States Dept. of Commerce, Bureau of the Census, Washington D.C., USA.

- Institut of Development Studies (IDS), University of Sussex, Brighton, UK.

- Applied Statistics Research Unit (ASRU), Mathematical Institute, University of Kent at Canterbury, Kent United Kingdom.

- The Institute of Social Studies (ISS), The Hague, The Netherlands.

- Munich Centre for Advanced Training in Applied Statistics for Developing Countries. Carl Duisberg, Gesellschaft e.V., Munich, Federal Republic of Germany.

- Department of Statistics, University of Newcastle Upon Tyne, United Kingdom.

- Department of Probability and Statistics, The University of Sheffield, U.K.

- Indian Agricultural Statistics Research Institute (IASRI), New Delhi, India

QUELQUES QUESTIONS IMPORTANTES CONCERNANT LES ACTIVITES DE RECHERCHE DANS LES CENTRES DU PROGRAMME DE FORMATION STATISTIQUE POUR L'AFRIQUE (PFSA)

Résumé

Le document traite de certaines questions importantes dans le domaine de la recherche dans les centres du PFSA. Il s'agit entre autres des besoins en matière de recherche et des difficultés rencontrées à cet égard. Il formule aussi des recommandations relatives à l'amélioration de la recherche et à la diffusion des résultats des travaux de recherche dans les centres du PFSA.

Le document fait aussi état des résultats de l'enquête menée par la CEA en 1987 sur la situation des activités de recherche dans les centres du PFSA. Ces résultats ont été présentés à la cinquième réunion des Directeurs des centres du PFSA, tenue du 26 au 30 octobre 1987 à Addis Abéba, Ethiopie.

La question de la recherche dans le domaine de l'agriculture a reçu une attention particulière dans le document. Des discussions sur la recherche dans ce domaine, ont eu lieu lors de deux ateliers du Commonwealth sur le système d'informations concernant les approvisionnements alimentaires, le premier à New Delhi, Inde, en 1985, et le second à Nairobi, Kenya en 1989. Des thèmes de recherche identifiés au cours des deux ateliers ont été présentés et discutés dans le présent document.

INTRODUCTION AUX METHODES DE COLLECTE DES DONNEES SUR LE SECTEUR DU BATIMENT ET DES TRAVAUX PUBLICS

I. Portée du secteur du bâtiment et des travaux publics

1. Aux termes des recommandations internationales, le secteur du bâtiment et des travaux publics comprend l'ensemble des entreprises et établissements relevant de la branche 5 de la classification internationale type, par industrie, de toutes les branches d'activité économique (CITI). Il s'agit :

a) des entreprises générales ou spécialisées effectuant principalement des travaux de construction sous contrat;

b) des unités faisant partie d'une entreprise et dont l'activité principale consiste en travaux de construction pour l'entreprise lorsqu'il est possible de fournir des renseignements à leur sujet.

2. A titre d'exemples, on pourrait mentionner parmi les entreprises générales de construction celles exerçant des activités telles que la construction, la transformation, la réparation et la démolition de bâtiments, de routes, de ponts, d'infrastructure ferroviaire et de barrages.

3. Les entreprises spécialisées n'exécutent, quant à elles, qu'une partie des travaux qu'implique la réalisation de l'ouvrage : installation de systèmes de chauffage et de climatisation, charpenterie, plâtrerie, pose de toitures, peinture et décoration, tôlerie et installations électriques, etc...

4. Les activités que l'on range traditionnellement dans le secteur du bâtiment et des travaux publics sont relativement nombreuses. Aussi est-il proposé, afin d'en avoir une liste exhaustive, de se référer à la CITI.Il convient de noter, toutefois, que la définition de la portée du secteur du bâtiment et des travaux publics proposée dans les recommandations internationales ne prend en compte que les entités bien organisées et aisément identifiables, c'est-à-dire les unités de production effectuant des travaux de construction à titre exclusif ou principal et utilisant les techniques modernes de gestion (tenue d'une comptabilité régulière et de type- moderne).

5. Dans la pratique, de nombreux pays s'efforcent d'étendre le champ de leurs investigations statistiques à l'ensemble des activités de construction. Celles-ci se répartissent en cinq grandes catégories :

a) entreprises du bâtiment et des travaux publics;

b) entreprises spécialisées dans différents corps de métiers;

(ii) Travaux contractuels de construction exécutés par des établissements ou des organismes relevant de secteurs autres que la construction et réalisant des travaux de construction pour le compte d'autres unités;

(iii) Travaux de construction pour compte propre exécutés par des unités de construction indepéndantes relevant d'entreprises ou d'autres organismes qui n'appartiennent pas au secteur de la construction proprement dit;

(iv) Travaux de construction pour compte propre exécutés par des établissements ou d'autres organismes n'appartenant pas au secteur de la construction proprement dit et ne possédant pas d'unité de construction indépendante;

(v) Travaux de construction pour compte propre exécutés par des particuliers.

II. Champ et fréquence des enquêtes sur le secteur du bâtiment et des travaux publics.

6. Le champ des enquêtes sur le secteur du bâtiment et des travaux publics dépenddecinq facteurs principaux :

(i) la fréquence des enquêtes;

(ii) les difficultés de collecte des informations;

(iii) la technique de dénombrement retenue;

(iv) l'unité statistique choisie et,

(v) les ressources disponibles.

7. En ce qui concerne la périodicite des investigations statistiques sur l'industrie du bâtiment et des travaux publics, on distingue l'enquête peu fréquente, l'enquête annuelle et les enquêtes à courte périodicité (enquêtes semestrielles, trimestrielles et mensuelles).

8. En règle générale, les enquêtes annuelles devraient porter sur les grandes unités de construction, dans la mesure où celles- ci réalisent la majeure partie des travaux de construction dans la plupart des pays. Dans les pays où les petites unités effectuent une partie importante des travaux de construction, il convient d'étendre le champ des enquêtes annuelles à ces unités et de recueillir un nombre limité de données à leur sujet, par la méthode des sondages.

9. L'enquête peu fréquente (recensement) est une extension de l'enquête annuelle, car elle vise à rassembler des données supplémentaires auprès des grandes unités et certaines catégories d'informations auprès des petites. En d'autres termes, elle doit permettre d'obtenir non seulement un tableau détaillé de la structure de secteur du bâtiment et des travaux publics, mais aussi des renseignements plus complets et plus précis que ceux fournis par l'enquête annuelle sur l'activité de ce secteur.

10. Les données recherchées dans le cadre des enquêtes peu fréquentes peuvent être obtenues en procédant à un dénombrement complet de toutes les unités statistiques relevant de l'industrie du bâtiment et des travaux publics ou en recensant un échantillon d'unités choisies avec une probabilité connue. Dans la pratique toutefois, il est recommandé de procéder à un dénombrement complet des grandes unités de production (pour lequel on utilisera de préférence la technique de l'auto- recensement), les petites unités faisant l'objet d'un échantillonnage réalisé selon la méthode de l'entrevue personnelle.

11. Lorsqu'on effectuedes recensements ou des enquêtes annuelles, il importe en général de couvrir la totalité des travaux de construction effectués pour compte propre par des unités indépendantes relevant d'entreprises ou d'autres organismes qui n'appartiennent pas au secteur de la construction. Dans la plupart des pays, les unités concernées sont en effet des unités importantes ayant une production élevée. Elles sont souvent mises en place par les compagnies d'électricité, les services d'entretien des routes et les régies de chemin de fer.

12. Le champ des enquêtes semestrielles, trimestrielles et mensuelles est nécessairement plus restreint que celui des enquêtes annuelles, dans la mesure où elles devraient se borner à fournir des indicateurs à court terme permettant d'analyser et d'évaluer le développement du secteur du bâtiment et des travaux publics.

III. Unités statistiques

13. Les types d'unités statistiques couramment utilisés lors des enquêtes sur l'industrie du bâtiment et des travaux publics sont:

(i) les entreprises ou des unités analogues (réalisateurs d'ensembles résidentiels par exemple);

(ii) l'unité fonctionnelle;

(iii) les bureaux permanents;

(iv) l'ouvrage (chantier, permis);

(v) l'établissement et l'unité locale;

(vi) les unités auxiliaires.

14. Les définitions proposées pour l'entreprise, l'établissement, l'unité locale, l'unité fonctionnelle et les unités auxiliaires sont les mêmes que celles adoptées dans le cadre des investigations statistiques sur le secteur industriel proprement dit.

15. Pour les statistiques portant sur l'industrie de la construction proprement dite, la plupart des pays adoptent l'entreprise et l'unité fonctionnelle comme unités statistiques car, ce faisant, ils disposent plus rapidement et plus aisément des données concernant les acquisitions de capitaux fixes, le nombre et la capacité des machines, les matériaux utilisés, les ventes, la valeur ajoutée et les stocks. Le choix de l'unité fonctionnelle est également recommandé lorsque le champ des enquêtes doit englober, outre les activités du secteur de la construction proprement dit, les travaux de construction effectués pour compte propre par des unités indépendantes relevant d'entreprises ou d'organismes n'appartenant pas à ce secteur.

16. Par contre, l'établissement et l'unité locale ne constituent pas des unités statistiques appropriées pour la collecte des données sur le secteur du bâtiment et des travaux publics. Il est en effet souhaitable qu'aucune restriction ne soit imposée concernant le lieu des activités de l'unité statistique, compte tenu de la fréquence des mouvements de la main d'oeuvre et des ressources physiques d'un chantier de construction à l'autre.

17. Les bureaux permanents et l'ouvrage (chantier, permis) peuventconstituer, dans certains cas, les entités de base des investigations statistiques sur l'industrie de bâtiment et des travaux publics.

18. Les premiers sont des bureaux à partir desquels certaines entreprises importantes gèrent leurs activités. Les bureaux permanents peuvent tenir une comptabilité distincte de celle de l'entreprise mère, gérer leurs propres entrepôts ou dépôts de matériel, leurs propres moyens de transport, etc...

19. L'adoption des bureaux permanents comme unité statistique facilite l'analyse géographique des données. Elle ne permet pas cependant l'obtention rapide des informations concernant les frais généraux ou le coût d'achat de matériel important, pour la simple raison que les comptes correspondants sont tenus par le siège.

20. L'ouvrage (ou le chantier) est par définition, un bâtiment ou une construction nécessitant un permis séparé. L'ouvrage est en principe situé en un lieu distinct et les travaux effectués font l'objet d'une autorisation distincte, sauf lorsqu'il s'agit d'ensembles résidentiels comprenant par exemple des logements, des écoles et des magasins. Dans ce dernier cas, en effet, des types différents de construction nécessitant parfois des autorisations distinctes sont exécutés sur le même emplacement.

21. Lors des investigations dont l'unité statistique est l'ouvrage, le fait de considérer les différents types de construction faisant partie d'un ensemble résidentiel comme des chantiers distincts ne permet de disposer que d'un nombre limité de renseignements, si la main d'oeuvre et les ressources physiques disponibles sont mises en commun pour la totalité des travaux.

22. L'adoption du chantier comme unité statistique ne facilite pas non plus la collecte des informations, lorsque plusieurs entrepreneurs participent simultanément, mais de manière indépendante, à l'exécution d'un même ouvrage.

23. Dans la pratique, les services nationaux de statistique ont recours à trois sources principales pour obtenir les données concernant le chantier:

(i) le service administratif délivrant les permis;

(ii) l'entreprise ou l'administration chargée d'effectuer les travaux en tant qu'entrepreneur principal et;

(iii) le chantier lui-même.

24. En conclusion, l'unité statistique retenue devrait varier selon la portée des enquêtes. Le tableau suivant récapitule les recommandations internationales en la matière:

Portée de l'enquête	Unité statistique proposée
a) Industrie de la construction proprement dite (bâtiment en général, travaux publics et entreprises spécialisées dans différents corps de métier).	Unité fonctionnelle (dans la plupart de cas, elle coïncide avec l'entreprisede construction elle-même, mais lorsque celle-ci comprend un établissement ayant une activité secondaire, l'unité fonctionnelle sera l'entreprise de construction, moins cet établissement).
b) Construction effectuée pour compte propre par des unités indépendantes relevant d'entreprises et d'autres organismes classés dans des industries autres que la construction.	Unité fonctionnelle (unit indépendante de construction travaillant pour compte propre)
c)constructioneffectuée pour compte propre par des établissements ou d'autres organismes non classés dans l'industrie de la construction, ne possédant aucune unité de construction indépendante.	Etablissement (ou autre organisme)
d) Ensemble des activités de construction.	Ouvrage (chantier, permis)

IV. Catégories de données à rassembler et à publier.

25. Les pays en développement devraient rassembler et publier le maximum d'informations sur leur industrie du bâtiment et des travaux publics, compte tenu de l'importance croissante de ce secteur dans leurs économies. A cet effet, ils pourraient utilement s'inspirer de la liste indicative ci-après : (cf. Annuaire de statistiques du bâtiment et des travaux publics des Nations Unies):

A. INDICATEURS GENERAUX D'ACTIVITE

1. Nombre d'unités statistiques

2. Nombre de personnes occupées.

3. Nombre de salariés

4. Traitements et salaires

5. Valeur de la production totale

6. Valeur des travaux de construction mis en place.

a) Nouvelles constructions et grosses réparations.

i) Bâtiments

a. A usage d'habitation
b. Non destinés à l'habitation

ii) Ouvrages de génie civil.

b) Travaux de réparation et d'entretien courants.

7. Valeur ajoutée.

B.ACTIFS FIXES

1. Additions brutes aux actifs

a) Machines, matériel de transport et autres materiels.

b) Bâtiments, etc.

2. Nouveaux actifs fixes acquis fixes

a) Machines, matériel de transport et autres matériels.

b) Bâtiments, etc.

C. CONSTRUCTION AUTORISEE DE NOUVEAUX BATIMENTS

Ensemble des bâtiments..... Nombre

Surface de plancher
Valeur à l'adjudication

1. Bâtiments d'habitation ...Nombre

Surface de plancher
Valeur à l'adjudication

a) Batiment de un ou deux logements .....Nombre

b) Immeubles collectifs....Nombre

2. Bâtiments non destinés à l'habitation ..... Nombre
Surface de plancher
Valeur à l'adjudication

a) Bâtiments industriels... Nombre
Surface de plancher

b) Bâtiments commerciaux ..... Nombre
Surface de plancher

Valeur à l'adjudication

c) Bâtiments colaires
..... Nombre
Surface de plancher
Valeur à l'adjudication

d) Bâtiments sanitaires
..... Nombre
Surface de plancher
Valeur à l'adjudication

e) Autres bâtiments (à spécifier)....
..... Nombre

Surface de plancher
Valeur à l'adjudication

a) Bâtiments industriels... Nombre
Surface de plancher
Valeur à l'adjudication

D. CONSTRUCTION AUTORISEE DE LOGEMENTS

1. Ensemble des logements .... Nombre
Surface de plancher

a) Logements neufs dans des bâtiments d'habitation ..... Nombre
Surface de plancher

i) Dans des bâtiments de un ou deux logements ..... Nombre

ii) Dans des immeubles collectifs ..... Nombre

b) Logements neufs dans des bâtiments non destinés à l'habitation..... ...Nombre
Surface de plancher

c) Logements créés par des travaux de rénovation et de transformation ..... Nombre
Surface de plancher

2. Ensemble des logements, par catégorie d'investisseurs :

a) Investisseurs publics..... Nombre
i) Etat et administrations locales ..... Nombre

ii) Autres organismes publics
..... Nombre

b) Investisseurs privés..... Nombre
i) Coopératives
..... Nombre

3. Ensemble des logements, par emplacement.

a) En zones urbaines..... Nombre

b) En zones rurales
..... Nombre

4. Nombre de pièces dans l'ensemble des logements.....Nombre

E. BATIMENTS NEUFS ACHEVES

Ensemble des bâtiments .....Nombre
Surface de plancher
Valeur

1. Bâtiments d'habitation
.....Nombre Surface de plancher Valeur

a) Bâtiments de un ou deux logements
..... Nombre

b) Immeubles collectifs
..... Nombre

2. Bâtiments non destinés à l'habitation
Surface de plancher
Valeur

c) Bâtiments scolaires.....Nombre
Surface de plancher
Valeur

a) Bâtiments industriels.....
..... Nombre

Surface de plancher
Valeur

e) Autres bâtiments
.....Nombre
Surface de plancher
Valeur

F. LOGEMENTS ACHEVES

1. Ensemble des logements.....
Surface de plancher

a) Logements neufs dans des habitations....Nombre

Surface de plancher

i) Dans des bâtiments de un ou deux logements
..... Nombre

ii) Dans des immeubles
....Nombre

b) Logements neufs dans des bâtiments non destinés à

l'habitation .... Nombre
Surface de plancher

c) Logements créés par des travaux de rénovation et

de transformation .....
..... Nombre

Surface de plancher

2. Ensemble des logements, par catégorie d'investisseurs :

a) Investisseurs publics
... Nombre

i) Etat et administrations locales..... Nombre

ii) Autres organismes publics
..... Nombre

b) Investisseurs privés collectifs ... Nombre

i) Coopératives
.....Nombre

3. Ensemble des logements, par emplacement:

a) En zones urbaines
.....Nombre

b) En zones rurales
.....Nombre

4. Nombre de pièces dans l'ensemble des logements ..... Nombre

AN INTRODUCTION TO THE METHODOLOGY FOR COLLECTING DATA ON CONSTRUCTION

(Summary)

The paper consists of three parts. The first part deals with the scope of the construction industry. The second part addresses the main issues relating to the coverage and frequency of surveys on construction, and the third part suggests a list of items of data to be gathered and published by African Statistical Offices.

In defining the scope of construction activity, the paper refers to major division 5 of the International Standard Industrial Classification (ISIC). It points out, however, that this classification is designed to include units which either undertake only construction work or whose main activity is construction. In order to cover the whole of construction activity, many countries therefore collect the data required irrespective of the main activity of the producing unit.

With respect to the coverage and frequency of surveys on construction, the paper emphasizes, inter alia, that various statistical units could be used and that their choice should take into account the scope of the surveys. It then gives a brief summary of international recommendations on the matter.

Finally, a list of tables contained in the UN Yearbook of construction statistics is reproduced in the paper. Developing countries are urged to use this list as a basis for gradually setting up their systems of construction statistics.

DATES OF POPULATION CENSUSES IN AFRICA

DATES DES RECENSEMENTS DE POPULATION EN AFRIQUE

Population census has been and continues to be one of the major sources of demographic data in Africa. Except for Chad, all member States of the region have so far conducted at least one census. The number of censuses conducted by the African countries can be summarized as follows:

Number of censuses conducted	Number of countries
1	6
2	13
3	10
4	4
more than 4	16
Total	49

Most of the censuses conducted in Africa before and after independence however differ in purpose, coverage, content and methodology. In countries like Swaziland, some of the pre-independence censuses were conducted in connection with tax collection. Some of the earlier census counts covered only non-Africans (e.g. Malawi, 1991). In Lesotho, some of the censuses prior to 1966 used the "assembly" method whereas self-enumeration was employed for non-Africans in the 1945 Malawi census.

In the table that follows attempt has been made to indicate pre- and post-independence censuses for easy reference. In the last column dates of the next scheduled census are given. The planned dates are as indicated by the respective governments according to the latest information available at the Statistics Division of ECA. Where no word from Government has been received the expected dates are given, in the belief that countries concerned will maintain a decennial census programme.

COUNTRY PAYS	DATES OF PREVIOUS CENSUS DATES DES RECENSMENTS PRECEDENTS	DATE OF NEXT CENSUS DATE DU RECENSEMENT SUIVANT
Algeria/Algérie	April/avril 1966*, February/ février 1977 March 1987	1997 E
Angola	1950, 1960, December/décembre 1979, 1983*	1983 E
Benin	March/mars 1979*	1990 P
Botswana	1904, 1911. 1921, 1936, 1946, 1956, 1964, August 1971* August/août 1981	1991 P
Burkina Faso	December/décembre 1975*, December/ décembre 1985	1995 E
Burundi	August/aout 1979*	August/aout 1990 P
Cameroon/Cameroun	April/avril 1976*, April/avril 1987	1997 E
Cape Verde/Cape Vert	1950, 1960, December/décembre 1970* June/juin 1980	1990 P
Central African Republic/ Rep.Centrafricaine	December 1975*, December 1988	1998 E
Chad/Tchad	--------	1991 P
Comoros/Comores	1958, September/septembre 1966, September/septembre 1980*	1990 P
Congo	February/février 1974*, December/décembre 1984	1994 E
Cote d'Ivoire	April/avril 1975*, March/mars 1988	1998 E
Djibouti	1960/61, January/janvier 1983*	1983 E
Egypt/Egypte	1882, 1897, 1907, 1917, 1927 1937, 1960, 1966, November/novembre 1976, November/novembre 1986	1996 E
Equatorial Guinea/ Guinee equatoriale	1950, 1960, 1965, July/juillet 983*	1993 P
Ethiopia/Ethiopie	May/mai 1984	
Gabon	1969/61*, May/mai 1970, August/ août 1980	1990 P
Gambia/Gambie	1881, 1891, 1901, 1911, 1921, 1931, 1963, April/avril 1973*, April/avril 1983	1992 E

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* - First census after independence/premier recensement après l'indépendance
P - Planned date o next census/date prévue du recensement suivant
E - Expected date of next census/date attendue du recensement suivant

COUNTRY PAYS	DATES OF PREVIOUS CENSUS DATES DES RECENSMENTS PRECEDENTS	DATE OF NEXT CENSUS DATE DU RECENSEMENT SUIVANT
Ghana	1891, 1901, 1911, 1948, 1960* March/mars 1974, March/mars 1984	1994 E
Guinea/Guinée	December/décembre 1972*, February/février 1983	1993 E
Guinea Bissau/ Guinée Béssau	December/décembre 1970, April/avril 1979*	1991 P
Kenya	1948, 1962, August/août 1969* August/août 1979, August/août 1989	1990 E
Lesotho	1875, 1891, 1904, 1911, 1921, 1936, 1946, 1956, April 1966, April/avril 1976*, April/avril 1986	1996 E
Liberia	1962, February/février 1974, February/février 1984	1994 E
Libya/Libye	1931, 1936, 1954*, 1964, July/juiller 1973, August/août 1984	1994 E
Madagascar	January/janvier, April/avril August/août 1975*	April 1990 P
Malawi	1901, 1911, 1921, 1926, 1931, 1945, 1956, August/août 1966*, September/septembre 1977, September/septembre 1987	1997 E
Mali	December/décembre 1976*, April/avril 1987	1997 E
Mauritania/Mauritanie	January/janvier 1977*, April/avril 1988	1988 E
Mauritius/Maurice	1846, 1851, 1861, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1944, 1952, 1962, June/juin 1972*, July/juillet 1983	1990 P
Morocco/Maroc	1960, July/juillet 1971, September/septembre 1982	1992 E
Mozambique	1940, 1950, 1960, September/septembre 1970, August/août	1990 P
Niger	November/novembre 1977*, May/mai 1998	1998 E

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* - First census after independence/premier recensement après l'indépendance
P - Planned date o next census/date prévue du recensement suivant
E - Expected date of next census/date attendue du recensement suivant

(a) - Sedentary population: November 1986/population sédentaire: Novembre 1986
Nomadic population: November 1987/population nomade: novembre 1987

COUNTRY	DATES OF CENSUSES IN AFRICA DATES OF PREVIOUS CENSUS	DATE OF NEXT SCHEDULED CENSUS
Nigeria	1911, 1921, 1931, 1953, 1963* November/novembre1973	April/rwanda,May/ma 1991 P
Rwanda	August/août 1978*	1991 P
Sao Tome & Principe	1950, 1960, September/septembre 1970, August/août 1981*	1991 P
Senegal	April/rwanda 1976*, May/June-ma/juin 1988	1998 E
Seychelles	1821, 1871, 1921, 1947, 1960, May/ma 1971, August/août 1977*, 1987	1997 E 1997 E
Sierra Leone	April 1963*, December/décembre 1974, December/décembre 1985	1995 E
Somalia/Somalie	February/février 1975*, November/novembre 1986(a)	1996 E
Sudan/Soudan	1955/56, April/rwanda 1973, February/février 1983	
Swaziland/Souaziland	1898, 1904, 1911, 1921, 1936, 1946, 1956, May/mai 1966, August/août 1976*, August/août 1986	1996 E
Tanzania, United Rep. of République Unie de Tanzanie	1948, 1952, 1957, August/août 1967*, August/août 1978, August/août 1988	1998 E
Togo	1958/60, March/mars April/rwanda 1970, November/novembre 1981	1991
Tunisia/Tunisie	1921, 1926, 1931, 1936, 1946, 1956, May/ma 1966*, May/ma 1975, March/mars 1984	1994 E
Uganda/Ouganda	1911, 1921, 1931, 1948, 1959, August/août 1969*, January/janvier 1980	1990 P
Zaire	July/juillet 1984*	1994 E
Zambia/Zambie	1963, August/août 1969*, August/août 1980	August/aout 1990 P
Zimbabwe	1962, May/ma 1969, August/août 1982*	1992 P

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* - First census after independence/premier recensement après l'indépendance
P - Planned date o next census/date prévue du recensement suivant
E - Expected date of next census/date attendue du recensement suivant

(a) - Sedentary population: November 1986/population sédentaire: Novembre 1986
Nomadic population: November 1987/population nomade: novembre 1987

PREPARATION AND PRODUCTION OF MAPS NEEDED AT DATA COLLECTION STAGE OF A CENSUS

1. Introduction

1. In the total process of a census the data collection or enumeration stage assumes to be the most crucial and extensive operation involving a large number of staff and consuming a major part of the census budget. The overall quality of census results obviously depends much on the success of enumeration to which adequate cartographic preparations can contribute a great deal by establishing comprehensive area frame and providing appropriate maps needed for the proper organization and conduct of enumeration. Cartography units have been established within and as permanent organs of the census offices in most of the African countries in order to have the relevant maps made available for enumeration on time and in adequate measures. But the preparation, reproduction and ultimate use of these maps is still not properly streamlined to meet the desired goals fully. The main issues and problems relating to the preparation and production of various maps needed at the data collection stage of a census are discussed in this paper with particular reference to African conditions.

2. Kinds of maps needed at data collection stage

2. The two main activities involved in the process of data collection are: i) setting-up of the field organization and ii) conduct and supervision of enumeration. The maps needed to serve as necessary reference tools in implementing these activities in a correct manner are accordingly envisaged to depict all the relevant information such as boundaries of areas, population places and routes of travel. The essence of preparing these maps is that all the census functionaries associated with data collection are individually provided with copies of relevant maps pertaining to the areas of their respective assignments. The use of these maps by the concerned census personnel would not only render the implementation of tasks assigned to them easier but also ensure an order of accuracy which may otherwise not be possible. Keeping in view the tasks of data collection and the categories of staff generally deployed to these the following three types of maps may be needed for use at data collection stage.

(i) Administrative area maps
(ii) Enumeration area maps
(iii) Supervision area maps.

3. Administrative area maps.

3. The administrative area maps are generally required by the census operators responsible for planning and organization of the enumeration activities. These maps should therefore depict the administrative as well as enumeration area boundaries and be mainly

prepared for the administrative divisions within which the Enumeration Areas (EAs) are to be coded. Such divisions may preferably be of second order in the administrative hierarchy which are known as district/local government areas/area councils in different countries. The boundaries of these divisions are often defined by the relevant Governmental Acts or Notifications and accordingly demarcated by the national mapping agencies on the standard maps series in the respective countries. In some countries the maps of these areas are produced as a standard series on medium scale. Thus depending on the types of maps produced by the national mapping agencies and on the availability of resources and time with the census offices for cartographic work, the administrative area maps can be processed in any of the following four main forms:

(i) Maps compiled and drafted in census offices,

(ii) Maps produced by national mapping agencies,

(iii) Maps prepared in the farm of mosaics by joining together the relevant toposheets,

(iv) Other types such as photo maps, satellite images, photo mosaics etc.

4. The maps prepared by census offices using most recent information/data obtained from concerned sources are obviously of the most appropriate type. They are also supposed to be the most up-to-date and exclusively depicting the information considered useful to enumeration work. However, if the available resources and time do not permit the preparation of these maps, the census offices may opt to use the other forms of maps in the order of preference as indicated above.

Texture and presentation of Administrative Area Maps

5. If census offices plan to take-up compilation and drafting of administrative area maps, it is pertinent to shortlist the items of information to be portrayed, select appropriate symbols and formulate the graphic design at the initial stages. As already indicated, these maps are required to depict all the information deemed useful for the planning organization and conduct of the enumeration. The details to be shown on these maps should therefore include inter alia the boundaries and headquarters of administrative sub-divisions, demarcations of the Enumeration Areas (EAs) and Supervision Areas (SAs) with locations of their bases, salient physical features, transportation and communication networks, etc. The symbolism and graphic presentation should be

designed in conventional fashion ensuring readability and proper understanding of the mapped information and leaving adequate blank space on the map for the insertion of additional marks/notes by the respective users without adversely affecting the clarity of map.

4. Enumeration Area Maps

6. An Enumeration Area (EA) may be defined as a well delineated territorial unit containing the prescribed population size and in which enumeration is to be carried out by single enumerator within the specified period of enumeration. However, the delineation of composite/larger or smaller EAs which may respectively need to be assigned to two or more enumerators or clubbed together/attached to other adjoining EAs, for the assignment to enumeration staff may not be ruled out in special situations.

7. The enumeration area maps are basically required by the field enumeration staff for correct identification of the respective areas assigned to each of them and the planning and conduct of enumeration. The delineation and mapping of Enumeration Areas are closely inter-linked and together influenced by several factors such as size and types of EAs, geographic terrain, etc. which are briefly discussed in the subsequent sections.

Size of EAs.

8. The "size" of an EA normally refers to the number of persons it contains. But the geographical size also assumes to be an important consideration in the delineation of EAs particularly in the areas of sparse population. As stated in the foregoing the ideal size of an EA in terms of population can be defined as the number of persons that an enumerator can enumerate within the specified period of enumeration. Geographically the size of an EA should be such as the enumerator may canvass conveniently by walking. Thus the size of EAs may differ from country to country depending on the length and complexity of the census questionnaire, duration of the period of enumeration, educational level of the enumerators, geographical terrain, etc. Nevertheless, the experience of past census, if there is any, and the results of field pre-test should provide the main base for determining the ideal size of EAs in a country.

9. Taking into consideration the various factors responsible for determining the size of EAs as indicated above, a population of 500 persons or 100 households can be recommended as ideal size of an EA for most of the countries in Africa. However, the size of EAs may be slightly variable for the rural and urban areas due to variations in their socio-cultural and physical settings. In this context it may be indicated that in the past censuses the size of urban EAs has been kept slightly larger than the rural EAs in many countries while the reverse was the case in some others. The main argument made in support of the former is that the urban EAs are

generally compact in size and therefore have lesser walking distances. This enable enumerators to get more time for enumeration and thereby cover larger number of persons. As for the latter it is argued that urban population have more complex and variegated socio-cultural characteristics. Enumerators therefore need, to spend more time in soliciting correct responses and completing the questionnaire. The non-availability of most of the urban dwellers at their residences during day time is also stated to be the reason for keeping the size of urban EAs low.

Other factors influencing the size of EAs

10. Even after determining the ideal size it may often not be possible to demarcate EAs of the exact prescribed size due to various factors such as the boundaries of administrative divisions and data reporting areas, alignments of visible physical features adopted for defining EA boundaries, geographical terrain, accessibility and means of transportation.

11. In most of the African countries the lower order administrative divisions comprise sub-units known as villages/localities/rural councils, and wards/townships in the rural and urban areas respectively. These sub-units are usually taken as base for delineation of EAs. Thus in rural areas the EAs are delineated by i) dividing the larger villages/localities into a number of EAs; ii) constituting every single medium village/locality into an EA and iii) clubbing two or more adjoining smaller villages/localities to form an EA. In each of these cases the identity of individual villages/localities is to be maintained so as to be able to produce data for these at the later stage. Thus in no circumstances an EA should be created by putting together the parts of two or more adjoining villages/localities. Similarly if a village is slightly bigger or smaller than the prescribed EA size, it should be delineated into one EA without subtracting from or adding to it a part to get the recommended population size.

12. The boundary forming features often do not divide the given administrative division into the segments of equal population size delineated on the basis of these features therefore may not be of equitable and exact prescribed size. On the other hand in sparsely populated areas the size of EAs should be determined in terms of geographical coverage taking into account the distances and walking time without laying much emphasis on population size. Evidently in practice it may therefore not be possible to have the EAs of prescribed population size in all the cases. But it is desirable to keep the extent of variation within the acceptable range which should be determined at the initial stages. For instance for the recommended size of 500 persons, the acceptable range of variation may be fixed as 300-600 persons.

13. In this regard it may be indicated that the upper limit of the range should not vary much from the normal size as the EAs of larger size are liable to adversely affect the accuracy of enumeration.

Types of EAs.

14. The two main types of EAs which need to be distinguished for the purpose of enumeration as well as data reporting are "rural" and "urban". Within these there are other sub-classifications concerning special types of EAs delineated for special categories of households or population. These may include large collective households-hotels, hospitals, hostels, camps, special groups of private households etc. - state farms, agricultural estates, tea estates, migratory population, defence or police establishments and so on. Due to basic differences in their characteristics the methodologies applicable to delineation of EAs for these population groups also differ slightly as indicated subsequently.

5. Delineation of EAs.

15. The delineation of EAs is carried out on the appropriate maps which are prepared/acquired by the census offices at the initial stages. These maps are termed as "base maps" and supposed to be on large or medium scales showing detailed topographic features and distribution of population. Before taking up delineation the contents of these maps are envisaged to be updated and supplemented with additional relevant information in the field. Needless to say that the quality of EA delineation is positively co-related to accuracy and comprehensiveness of base maps. The selection of "base map" is therefore of prime importance in the exercise of EA delineation. For rural areas the 1:50 000 series of topographic maps produced by surveys departments in most of the countries is considered to serve as the most appropriate base map for EA delineation. However the scale may be reduced or enlarged appropriately for the densely or sparsely populated areas respectively. For urban areas on the other hand, the large scale topographic or general reference maps produced by Surveys Department may be used as the base for EA delineation. For countries where these maps are of old edition, a thorough field updating may be necessary. The countries not having these or other similar maps available from any source may have alternatively to resort to field sketching which is a tedious and time consuming exercise or use other materials such as high resolution satellite images or aerial photographs for the purpose.

Basic considerations

16. The basic factors guiding EA delineation are as follows:

(i) The EAs should be delineated within the lowest order of administrative divisions for which the census data are

to be reported. The delineation should also take into account the boundaries of villages/urban places, if the country has plans to produce data at these levels. In this case the boundaries of villages/urban places should be identified with the help of concerned local officials and demarcated on the base maps and the EAs should be delineated within these areas. Even if not administratively notified, these boundaries can be used for the purpose of census data reporting.

(ii) The EAs in an administrative area should cover its entire space in an exhaustive and mutually exclusive manner such that there should be no "no-man's land" and also there should not be any area overlap among the EAs.

(iii) The EAs should be of compact size, to the possible extent.

(iv) As far as possible, the boundaries of EAs should be made identifiable by delineating these along the visible ground features such as roads, footpaths, drains, fences, physical features, bench mark locations, etc. Where such features are non-existent, the imaginary boundary lines may be drawn with reference to prominent buildings or other locational features.

(v) The special institutions like hospitals, army barracks, police camps, prisons, etc. should be constituted into separate EAs.

(vi) In nomadic areas, the EAs should be delineated in consultation with local tribal chiefs and concerned administrative authorities and taking into account the ethnic affinities of nomadic groups, areas of their normal settlements and probable routes, periodicity and anticipated destinations of their movements.

(vii) In the area of sparse population distribution, the territorial size of EAs should be such as may be easily covered by the respective enumerators by walking during the specified period of enumeration.

(viii) As far as possible, the enumeration areas should have a population closer to the prescribed size.

(ix) The delineation of EAs in rural areas should also take into consideration the relevant geo-climatic factors such as soil types, rainfall, etc. in order to make the EAs usable for the agricultural census and other similar data enquiries.

(x) In urban areas the EAs in core town and peri-urban tracts should be delineated distinctively, if the urban population need to be further classified by these areas for the purpose of data reporting.

Methodology of EA delineation

17. Due to realities of widely differing geographic and cultural settings within as well as among the countries in Africa it is not possible to formulate a single standardized optimal methodology for delineating EA boundaries which may efficiently be applicable to all the situations. However, in general, the process of EA delineation may involve following steps:

(i) Obtaining population and housing unit (HU) estimates for the administrative units of lowest order within which the EAs are to be delineated.

(ii) Determining the number of EAs to be delineated within each administrative unit on the basis of these population/HU estimates.

(iii) Delineation of EAs in the field by taking into account the distribution of HUs and visible ground features.

(iv) Preparation of household listings for individual EAs.

(v) Adjusting boundaries of the EAs found to have population or number of households exceeding the prescribed size.

(vi) Correcting household listing to reflect the adjustments made in EA boundaries (in urban areas it would be better to prepare the lists of housing units due to frequent movements of households from one place to another).

18. The estimates of population or housing units needed initially for determining the number of EAs may be obtained from the local administration as they generally maintain such records for various administrative requirements. For this purpose they should be given an advance intimation of the requirements as sometimes the relevant records may not be readily in order with them. In the countries where it is not possible to obtain the population estimates through the local administration, the field mapping staff should collect the requisite information themselves by some suitable system of blocks or segments discernible on the concerned base maps and later use the same for delineating EA boundaries and compiling EA wise household listings. These population estimates can also be used for various administrative or planning purposes until such time as the actual census data become available.

19. The support of local administrative personnel can also be solicited for compilation of household listings (for rural EAs)

and HV listings (for urban EAs). These listings should be compiled on prescribed forms which should be reproduced in sufficient number of copies and given to field staff for stipulated uses. The suggestive formats of these listing forms are given in Annex I & II for reference purpose.

6. Preparation of enumeration area maps

20. The ultimate objective of EA delineation exercise is to prepare appropriate maps of individual EAs for use by the enumerators at the time of enumeration. The EA maps are supposed to contain all the information necessary for correct identification of area covered under each EA and enumeration of entire population lying within its outer limits. Thus the contents and formats of EA maps and therefore the methodology of their preparation may slightly differ according to the types of EAs and the quality of base maps used for their delineation. However, following are some of the features which must be shown on these maps.

(i) Outer boundary of the EA by some prompt and distinctive line symbols which should be drawn in solid black to ensure good quality reproduction. However, if the EA boundary does not seem to be clear enough, it should be highlighted with red or orange or any other conspicuous colour on the enumerators' copy to avoid any ambiguity.

(ii) Locations of all buildings/structures should be shown if these can be determined fairly accurately. The buildings/structures may be further differentiated according to their uses such as residential or non-residential and types such as permanent, temporary, etc. Where all buildings/structures cannot be shown, due to scale limitations, the locations of prominent ones should be shown with adequate identification references.

(iii) Roads should generally be shown with double line to make clear that the EA boundary running in the middle of road includes one side but not the other. If single line roads are used as boundaries, the enumerator may canvass both the sides. The road destinations should be indicated at the end to further ensure the correct identification of area by the enumerator.

(iv) Boundary junctions and codes of the adjoining EAs should be indicated appropriately along the outer boundaries to help an enumerator locate boundaries of his EA correctly. The common features appearing on adjoining EA maps should be depicted in identical manner.

(v) A legend explaining symbols used on the map should be given at appropriate place. The shape of larger buildings such as industries and institution should be

shown as accurately as possible and labelled by name. If space on the map is not enough, a number can be used for identification purposes and keyed to the name listed elsewhere on the same map.

(vi) The geographic identification codes of the major and minor administrative divisions within which the EA is located should be given at appropriate place.

(vii) If possible, the scale of EA map should be indicated in simple graphic form by which the line is divided into standard size intervals indicating the measurement values and type of measuring units used.

(viii) To indicate direction the north arrow should be given somewhere in the upper part of map. To the possible extent map should be oriented to keep the north arrow pointing upward.

21. In order to have the presentation of above features made in a standardized fashion, the census office should design the suitable format of EA map and get it printed on the drafting base as well as ordinary paper. A sample format of EA map is given in Annex III.

Scale of the EA maps

22. As a general rule the EA maps should be prepared on reasonably large scale to show the requisite information as indicated in the foregoing, with clarity. Thus the decision about scale should be taken keeping in view the areal extent of the given EA and the quantum of details to be depicted on it. Some proposed scales for EA maps in rural areas of different population densities are given below.

Population density (No. of persons per square kilometer)	Proposed scale of EA maps*
Below 25	100,000
25 - 50	50,000
50 - 200	20,000
Above 200	10,000

N.B These scales are just indicative and have been assessed keeping in view the space available for EA map on the sample format.

Similarly the scales for urban EAs may vary from 1:2000 to 1:10000 depending on the density of population.

General procedures

23. The procedural steps involved in preparation of EA maps may differ according to types of EAs to be mapped as well as the scale and quality of base maps used for their delineation. So far as the types are concerned, the following are expected to be found in most of the countries.

Area		EA types
Rural	(i)	EAS constituting two or more localities/villages
	(ii)	EAs constituting single locality/village
	(iii)	EAs constituting parts of a large locality/village
Urban	(iv)	EAs constituting parts of urban or its sub-divisions.

24. On the EA maps of the first two categories, should depict population clusters and village boundaries together with other relevant topographic details such as roads, foot paths. On these types of EA maps it is not important to show the locations of each and every structure as they include a village or locality in whole which can be easily identified on the ground for purpose of enumeration.

25. For preparing maps on the last two categories of EAs which constitute parts of a settlement, a separate treatment is is however neede. On the maps of such EAs it is necessary to depict the locations of individual structures together with other relevant details including boundary forming features. In case of EAs delineated on the basis of imaginary lines, it becomes necessary to identify the structures located along such boundary lines by labeling the names of their owners, or otherwise in order to enable enumerators relocate boundaries of these EAs correctly. This procedure holds more relevance to the squatter areas where the imaginary lines used for delineating EA boundaries are not easy to relocate.

26. Another important factor which determines the methodology of EA map preparation is the scale and quality of base maps. In this context the two main classes into which the areas of a given country may be divided are as follows:

(i) Areas for which base map coverage on suitable scale and of suitable vintage is available.

(ii) Areas for which the available base map coverage is not on suitable scale.

27. In the areas of first category for which the base maps on scales recommended for preparation of EA maps are available, the delineation of EA boundaries as well as plotting of other relevant details as indicated in the foregoing can be carried out on the

base maps itself. After fair drafting these base maps should then be reproduced in adequate number of copies and the EA maps be produced directly from these in "cut-out" forms. These "cut-out" maps may be mounted on the plain sheets of paper or printed formats and subsequently supplemented with other map features such as scale, north arrow, legend, etc in an appropriate manner. The EA boundaries and codes should be highlighted in colour by felt-tip markers to avoid any confusion. This procedure will certainly consume lesser time without affecting, in substance, the quality of maps. However, if the resources and time permit, the maps of individual EAs should be traced from these base maps and fairly drafted for the sake of better presentation.

28. On the other hand in the areas for which base maps on scales recommended for EA maps are not available, the preparation of individual EA maps on larger scales need to be taken up separately. It may be noted that most areas in African countries may belong to this category. The general procedure of preparing EA maps for these areas may involve following steps:

(i) To enlarge the map of given EAs from the concerned base maps on which the delineation is carried out.

(ii) On the enlarged maps obtained thus, to plot additional requisite details which possibly could not be depicted on the base maps due to scale limitations.

(iii) To fill-in other features such as identification codes, north arrow, scale, etc.

29. While preparing the maps of individual EAs it must be ascertained that shapes of EAs shown on the base maps and the corresponding EA maps must look identical and the common boundaries on the maps of adjoining EAs, prepared on same scale, must perfectly coincide with each other.

Dealing with special categories of EAs

30. This category of EAs may include collective households such as hospitals, hostels, hotels, prisons and army camps, nomadic areas, areas inhabited by hunters, semi-nomadic pastoralists, remotely located fishing and mining communities, areas of shifting cultivation and so on.

31. The procedures applicable to delineation of EAs comprising collective households are, more or less, same as of normal EAs except that in respect of such EAs the detailed EA maps may not be so necessary. If the population of any collective household is less than the prescribed size range, it should be clubbed with other neighbouring population for purpose of EA delineation. However this procedure may not be applicable to the collective households of classified nature such as army camps, police camps,

prisons for which the enumeration arrangements are generally made by the concerned administrative authorities and carried out by their staff.

32. In the regions of nomadic and semi-nomadic population, the cartographic work should be planned and carried out with a greater involvement of local administrative personnel and tribal leaders who generally have information about the seasonality and directions of the movement of nomadic population in their areas. With the support of these local officials and the elders of the nomadic communities who generally stay behind it may be possible to know where the people of a given nomadic group will possibly be at the time of enumeration. The general procedural steps proposed to be adopted for delineation of EAs in these areas are as follows:

(i) Plot the locations of localities/settlements, water points, etc. in nomadic areas on the base maps and obtain estimates of population in respect of each locality with the help of local administrative personnel.

(ii) Determined the number of the EAs on the basis of estimated population and delineate localities into EAs accordingly.

(iii) Delineate EAs for temporary and nomadic population separately and assign geographic codes to these with proper identification.

(iv) Collect all other necessary information on people in these EAs which may be helpful in planning and conducting of enumeration, like places of their permanent residence, expected duration of stay at the present place, time and destination of next movement, etc.

The maps for this category of EAs should be prepared as per the relevant procedures described in para 6.2 above.

Metropolitan and larger urban areas

33. Delineation of EAs in metropolitan cities sometimes poses unique problems due to rapid expansion of their population and high degree of congestion particularly in squatter areas. Base maps which should cover recent expansions and peripheral areas of these cities are often not available necessitating the preparation of field sketch maps which at times may not be feasible due to lack of resources and time. For such areas the census cartographers should therefore try to make use of aerial photographs, if available. The use of high resolution satellite images may also be helpful in preparing base maps and defining the limits of

residential areas. If the photo mosaics or machine plots of these areas are available at surveys department copies should be obtained and used to fill in the additional details and delineate the EA boundaries.

34. For delineation of EAs, in larger urban areas the estimates of population should be derived from the number of housing units which should be counted and numbered by the cartographery field staff. Normally an urban EA may contain about 80-100 housing units. The locations of housing units should be shown on the EA maps indicating their numbers as given in the structure listing form and also labelled on the main entrances of respective housing units.

7. Boundary descriptions

35. The descriptions of village locations and EA boundaries should be written briefly but fully by field supervisors and given at the appropriate places on the respective EA maps. The location of a village/locality should be described in terms of its position to adjoining villages indicating its road distance, direction and means of approach form the major settlements of that area.

36. The description of EA boundaries should generally start from its first approach point and then move systematically in clockwise direction. The boundary description should be typed or written in a very legible manner. The names of features indicated in the boundary description must also appear on the EA map to enable the enumerator identify boundaries correctly.

8. Numbering of EAs

37. The numbering of EAs should be made within the lowest order administrative divisions for which the census data are to be reported. If there are further sub-units for which the data are also likely to be tabulated, the boundaries of these sub-units should be taken into consideration at the time of delineation such that the EA boundaries do not cut across the EAs falling within a sub-unit are numbered in a continuing sequence.

38. Since the EAs form basic units of data collections, these need to be identified by types of areas for which the data are to be processed and produced. This can be achieved in two ways: a) by adding identifier digit to the EA codes or b) assigning separate blocks for each type of EAs in the overall range of codes earmarked for the EAs. For operational convenience the second alternative seems to be more appropriate. Thus for instance in a three digit code space (001-999) normally allocated for EA codes, the codes 001

to 399 may be assigned for urban EAs, 401 to 699 for rural areas 701 to 799 for nomadic and semi nomadic EAs, 801 to 899 for EAs comprising hunters, mining and forestry camps etc. and 901-999 for EAs made of collective households. The arrangement and size of blocks may be devised according to number of classifications to be made and requirements of data processing.

The system of numbering

39. The EA code numbers should be assigned in a fashion which facilitates quick location of an EA number on the map. To achieve this the numbers should be assigned according to geographical contiguity so that the consecutive numbers fall next to each other in an apprehensible direction. The most preferred method of assigning consecutive codes is to start coding from the northwest corner of map and follow the serpentine trend ending at the opposite end i.e. south-east. If there are further sub-units which need to be identified in the coding, the EAs within any such sub-units should be assigned codes in continuing sequence.

40. In larger urban areas the coding of EAs should be done by blocks. In smaller urban areas the number may start from core center and move in spiral fashion to end in the peripheral areas.

Listing of EAs

41. After delineation and coding of all the EAs in a given administrative area the listing of EAs should be prepared indicating the basic information on each EA such as geographic identification code, name (name of the main settlement or sector covered by it) and estimated population. These lists should be compiled on standard forms which may be designed and printed in sufficient number. An indicated format of the EA listing form is given in Annex IV.

9. Supervision Areas Maps

42. A group of census enumerators each responsible for enumeration in one EA is supervised by one supervisor who reports to the next higher supervisor and so on. Generally an enumeration supervisor is assigned to see the work of five enumerators but sometimes this number may vary depending on geographical conditions and the number of EAs delineated within the given lowest level administrative areas. The demarcation of supervision areas should normally be carried out by field supervisors after the delineation of EAs are finalized. Some basic considerations to be taken into account for defining the boundaries of supervision areas are as follows:

(i) The supervision area (SA) should be compact containing contiguous EAs.

(ii) Before demarcation, the number of SAs within the next higher administrative area should be determined on the basis of number of EAs demarcated within the same.

(iii) To the extent possible a supervision area should not have physical barriers that may hinder the movement of the supervisor from one part to another.

(iv) It would be better if the EAs of one SA have consecutive code numbers. To attain this the coding of EAs should be done after demarcation of SAs.

43. The SA maps should be traced out from the concerned base maps. The main purpose of a supervision area map is to show the total area with its division into EAs for which the enumeration supervisor is responsible. In addition, the SA map should also show other details relevant to the work of the supervisor such as the routes of travel, the location of settlements and the topographical features which were used to define the EA boundaries and the locations of permanent places. If not shown on base maps, these details should be copied from the respective EA maps.

44. Sometimes it is not possible to prepare maps of individual SAs due to lack of time and resources. In such situation the base maps showing demarcations of supervision areas should be incorporated with relevant additional details and reproduced in adequate numbers. Each supervisor should be provided with a copy of base map within which his assignment area is located. For quick location, the SA boundaries can be highlighted in colour.

10. Office processing of enumeration maps

45. The field copies of EA and SA maps prepared by the cartography field staff often are in very crude form and in several cases even deviate from the prescribed formats and contents. They therefore need to undergo thorough checking and recompilation, wherever necessary, to ensure the accuracy of contents and standardization of presentation before final drafting.

46. The checking of field maps should be carried out by cartographers and it should cover the following main points.

(i) Matching of a given EA boundaries with those of adjoining EAs to ensure complete coverage of areas without any overlap or gap.

(ii) Checking of the EA boundaries with other relevant maps such as SA maps, administrative area maps (base maps) showing EA delineation to ensure uniformity of boundary alignments.

(iii) Checking the names of localities, etc. with other corresponding documents like locality listings etc.

(iv) Checking the identification codes given on the maps with the area code list. It may be noted that identification codes given on EA maps and its other related documents must be identical.

47. The field maps may be recompiled if they are not in order or enlarged to accommodate their contents with clarity.

11. Designing and drafting of EA and SA maps

48. Uniformity of presentation is an essential element in the designing and drafting of EA and SA maps. To achieve this in a better way, it is suggested that the EA maps should be prepared and drafted on printed formats. If the EA maps are planned to be produced in cut-out forms from the copies of respective administrative area maps, the cut-out portions should be mounted on printed formats or plain sheets of paper and then added with other elements like scale, legend, etc. If instead of cut-out maps the enumerators are to be provided with the copies of administrative area maps containing EAs assigned to them, the designing and drafting of these maps should be done on a uniform pattern. Also these maps must be kept handy in size. In case of bigger administrative areas, the drafting should be done by splitting these into parts of suitable size.

49. The drafting of enumeration maps has to follow the standard practices of drawing which need not to be repeated here. Since these maps are not intended to be printed or published, the quality of drafting should not be emphasized more than what is necessary for the purpose of enumeration.

12. Reproduction of EA and SA maps

50. The reproduction of enumeration maps should be done in required number of copies by diazo or photo copying processes. The quality of paper used for producing these copies should be strong enough to bear the strains of field handling. The reproduction of maps should start soon after sufficient number of EA and SA maps are drafted/prepared and be continued along with the drafting operation. This is essential particularly when the EA maps are to be cut out from printed copies as it would involve additional time and efforts to have the maps in usable form.

13. Preparation of instructions regarding use of EA and SA maps

51. In order to fully realize the envisaged contribution of EA and SA maps in having a correct and complete census enumeration, it is

necessary that the enumerators and supervisors are imparted with adequate training on the basic principles of map interpretation with particular reference to the maps being provided to them. Even the best prepared maps can turn to be non-effective if their users fail to understand and interpret them in correct manner. Therefore for census offices the task of preparing enumeration maps gets complete only when the instructions on the use of these maps are also prepared and included in the enumerators and supervisors training manuals. These instructions need to be explained to the concerned enumeration staff to the points with proper illustrations and practical exercises.

52. The instructions prepared on the use of enumeration maps for inclusion in the enumerators and supervisors manuals should be very concise and deal with all the relevant points. In general, these should cover the following.

(i) Basic map elements such as the scale of enumeration maps and its use in converting the map distances to ground distances and vice versa; the symbol legend for identifying the relevant ground features on the maps, the direction for orienting the map and so on.

(ii) The envisaged uses of maps which would mainly include: a) to locate the EA/SA within the given administrative division, b) to identify the EA/SA boundaries on the ground with the help of their alignments on the map and relevant boundary descriptions, c) to prepare a plan of field canvassing, d) planning of visits to structures/places of human habitation and e) marking structures for the call backs, if any.

(iii) Updating of maps at the time of field canvassing which should include: a) verification of mapped details and making necessary changes in their positioning or alignment, b) deleting the features not found existing, c) adding those found on the ground but not shown on the map, d) verifying names of the places and features.

(iv) The return of the updated EA/SA maps along with the completed questionnaires should be underlined otherwise enumeration staff generally tend to retain these maps as souvenirs or spoil and misplace them as they do not consider their safe use and return to the census office as essential.

Training Programme

53. The training of enumeration staff on the use of relevant maps must be integrated with the training in other enumeration activities. To make the training successful, the trainees should be given detailed explanations on each point with proper illustrations which would normally not be possible to include in the enumerators training manual. In the overall training programme about half a day may be earmarked for class room lectures and half a day for practical exercises and field demonstrations exclusively on the use of maps. The copies of typical EA and SA maps should be included in the manuals for ready reference at the time of training.

Annex I

HOUSEHOLD LISTING FORM

Name _____ Code

Province/State _____ ☐

District _____ ☐

Local Area _____ ☐

EA _____ ☐

No.	Name of the Head of Household	No of Persons	S. No	Name of the Head of Household	No. of Persons

Annex II

HOUSEHOLD LISTING FORM

Name _____ Code

Province/State _____ [ ]

District _____ [ ]

Local Area _____ [ ]

EA _____ [ ]

No.	Name of the Head of Household	No of Persons	S. No	Name of the Head of Household	No. of Persons

Name Code

1990 Population and Housing Census

State .....

District .....

Local Area/Ward .....

Village (I) .....

Village (II) .....

Village (III) .....

E A NO .....

LEGEND

Road Metalled ..... ———————

Road Unmetalled ..... ==========

Foot Path ..... - - - - - -

Rail Way ..... ———————

River .....

Hill .....

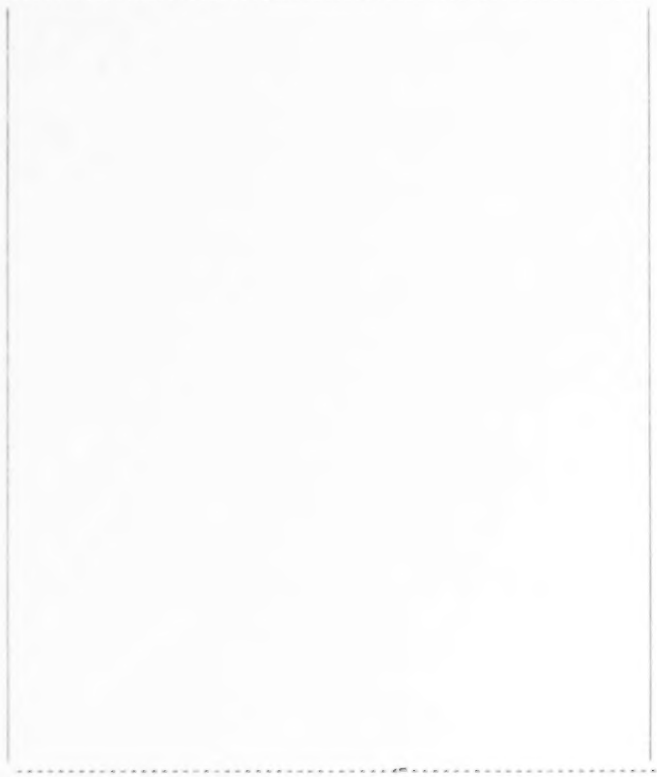
E A Boundary ..... -X-X-X-X-

Settlement Cluster .....

Structures, Residential .....

Structures, Nonresidential ...

Note-Write Names of roads, street and prominent places



Name of Field assistant .....

Name of Supervisor .....

Date .....

Annex IV

HOUSEHOLD LISTING FORM

Name _____ Code

Province/State _____ [ ]

District _____ [ ]

Local Area _____ [ ]

EA _____ [ ]

No.	Name of the Head of Household	No of Persons	S. No	Name of the Head of Household	No. of Persons

PREPARATION ET PRODUCTION DES CARTES NECESSAIRES AU DÉNOMBREMENT D'UN RECENSEMENT

La qualité des données d'un recensement dépend dans une large mesure du dénombrement dans la réussite duquel la cartographie préparatoire joue un rôle très important par la fourniture de cartes appropriées. Ce document traite des différents aspects relatifs à la préparation et à la production de ces cartes en se référant tout particulièrement aux conditions dans les pays africains.

Les trois types de cartes généralement nécessaires pour la planification, l'organisation et la réalisation du dénombrement sont: i) les cartes des circonscriptions administratives; ii) les cartes des zones de dénombrement (ZD) et iii) les cartes des zones de supervision (ZS). Les cartes des circonscriptions administratives sont surtout utilisées par les responsables du recensement pour la planification et l'organisation des activités du dénombrement. Ces cartes sont établies pour chaque division administrative.

Les cartes produites par les services cartographiques peuvent être utilisées lorsque le Bureau de recensement n'est pas en mesure de préparer de telles cartes.

Les zones de dénombrement sont nombreuses et de nature variée et c'est pour cela que la préparation de leurs cartes est complexe et longue. Le format et le contenu des cartes de ZD ainsi que la méthodologie à utiliser doivent tenir compte de nombreux facteurs tels que le type et les dimensions de la ZD, la situation géographique, les caractéristiques sociales et ethniques de la population, etc... D'une manière générale, les cartes des ZD sont à grande échelle pour indiquer l'emplacement des populations (localités, structure), les voies de communication et beaucoup d'autres choses comme les détails topographiques qui pourraient être utiles à l'agent recenseur pour situer les limites de sa zone d'intervention et pour la conduite du dénombrement de toute la population.

Les cartes des zones de supervision (ZS) servent aux superviseurs du dénombrement qui généralement encadrent environ 5 agents recenseurs. Mais quelquefois ce nombre varie en tenant compte des conditions géographiques et des besoins administratifs. La carte des zones de supervision est issue de la carte de base de terrain mise à jour et agrandie si nécessaire pour représenter d'autres informations supplémentaires ne figurant pas sur les cartes des ZD.

Toutes les cartes nécessaires pour le dénombrement doivent être déterminées et dessinées conformément aux pratiques cartographiques conventionnelles. Un nombre adéquat de copies de chaque carte doit être disponible pour les besoins des agents du dénombrement qui doivent être formés à l'utilisation de telles cartes avant le dénombrement.

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